ENGINEERING AND MINING JOURNAL

A McGRAW-HILL PUBLICATION

Science Library

AUGUST, 1948

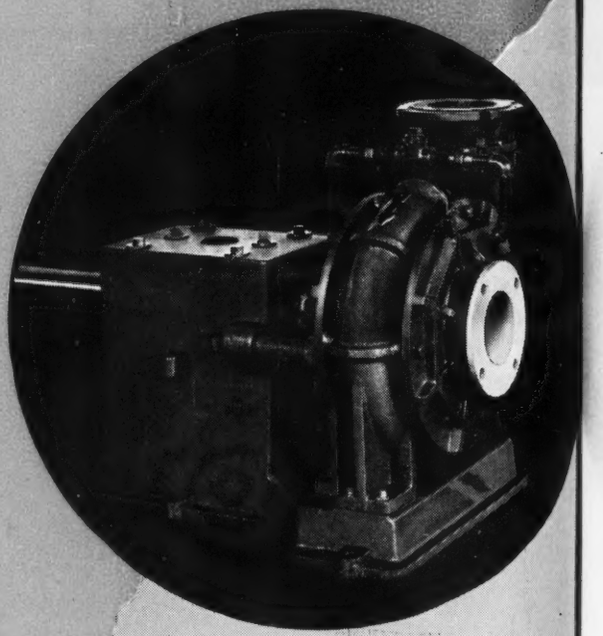
AUG 13 1948

Driller in Colorado fluorspar mine. See "How to Operate a Stoper"—Page 78

A New Stripping Scheme on the Mesabi — Page 70

Report on Two Seasons' Service 1946 and 1947 on the Mesabi Iron Range

One C-Frame Hydroseal Rubber Lined Pump handled 134,000 long tons of solids at a cost of only $0.0009 per ton for replacement parts. It operated 3043 hours handling 165 million gallons of water carrying tailings of minus ¼" having a dry gravity of 3.0, the sp. gr. of the solution being 1.15. Discharge is through 4000 feet of 8" pipe. One 25 H.P. motor is used, V-belt connected to the pump shaft, the total power input to the motor being 18 H.P. . . . This record happens to have been made in an Iron Ore Washing Plant in Minnesota, but we have files showing comparable Hydroseal pumping economies handling all kinds of materials in practically every mining center of the world.



Send for New Catalog

Catalog No. 547 tells the complete story about Hydroseal Sand, Slurry and Dredge Pumps and shows performance tables of all standard sizes from 1½" to 14" suction and discharge.

HYDROSEAL PUMPS

HYDROSEAL, PACKLESS AND MAXIMIX DESIGNS ARE COVERED BY PATENT AND APPLICATIONS IN THE MAJOR MINING CENTERS OF THE WORL

Correspondence from United States and Canada to

ALLEN-SHERMAN-HOFF CO., 229 S. 15th St., Phila. 2, P

Correspondence from anywhere else in the World to

A-S-H EXPORT CO., 229 S. 15th St., Phila. 2, P

CABLE ADDRESS: ASH, PHILADELPHIA—BENTLEY'S CODE

ENGINEERING AND MINING JOURNAL

ALFRED M. STAEHLE, Publisher **EVAN JUST, Editor, on leave** **H. R. MATHIAS, General Manager**

R. H. RAMSEY, Acting Editor; H. C. PARMELEE, Editor Emeritus; A. H. HUBBELL, Managing Editor; A. W. KNOERR, Associate Editor; H. H. Wanders, Market Editor; R. L. STRONG, F. W. BROOKE, Assistant Editors; F. A. ZIMMERLI, Layout Editor. San Francisco: J. B. HUTTL, Associate Editor; G. J. YOUNG, Consultant. Washington: PAUL LEACH, Jr.

Volume 149 **Number 8**

A McGRAW-HILL PUBLICATION

McGRAW-HILL PUBLISHING COMPANY, INC.

James H. McGraw (1860-1948)
Founder

JAMES H. McGRAW, JR., President; CURTIS W. McGRAW, Vice President and Treasurer; EUGENE DUFFIELD, Executive Assistant for Publications; NELSON BOND, Director of Advertising; JOSEPH A. GERARDI, Secretary; DEXTER KEEZER, Director, Economics Department; J. E. BLACKBURN, JR., Director of Circulation.

•

Company Offices

Publication office: 210 S. Desplaines St., Chicago 6, Ill. Editorial and Executive Offices: 330 West 42nd St., New York 18, N. Y. Cable address: McGraw-Hill, New York. Branch Offices: San Francisco 4, 68 Post St.; Chicago 11, 520 N. Michigan Ave.; Los Angeles 14, Pacific Finance Bldg.; Washington, D. C., National Press Bldg.; Pittsburgh 22, 738-9 Oliver Bldg.; Detroit 26, 2980 Penobscot Bldg.; Cleveland 15, 1510 Hanna Bldg.; Boston 16, 1427 Statler Bldg.; Philadelphia 3, 17th & Sansom Sts., Atlanta 3, 1011 Rhodes-Haverty Bldg.; St. Louis 8, Continental Bldg. District Managers: New York, T. E. Alcorn, F. W. Roets; Philadelphia, W. A. Potter; Cleveland, W. M. Spears; Pittsburgh, H. C. Chellson; Chicago, C. J. Coash and G. A. Mack; San Francisco, J. W. Otterson; Atlanta, R. C. Maultsby; Los Angeles, R. N. Phelan. London address: McGraw-Hill Publishing Co., Ltd., Aldwych House, Aldwych, London, W.C. 2, England. Cable address: Blacklash Estrand, London. Other McGraw-Hill foreign news offices in Paris, Berlin, Moscow, Prague, Shanghai, Bombay and Mexico City.

•

Subscription Information

ENGINEERING AND MINING JOURNAL, August, 1948, Vol. 149, No. 8. Published monthly at Chicago, Ill. Return postage guaranteed. Subscription rates: United States and possessions $3 a year, $4 for 2 years, $5 for 3 years. Canada $4 a year, $6 for 2 years, $8 for 3 years. Pan American countries $5 a year, $8 for 2 years, $10 for 3 years. Elsewhere $15 a year, $25 for 2 years, $30 for 3 years. Please indicate position and company connection in all subscription orders. Price of this issue, 50 cents. Application for second class entry at the post office in Chicago, Ill. is pending under the Act of March 3, 1879.

AUGUST 1948

Editorials 67

South Agnew Stripping Scheme Unique on Mesabi 70

Photo-Electric Cell Used to Check Dials on Skip Hoist 74

Oxygen Shows Advantages in Metallurgical Work 74

Glory-Hole Operation Uses Coyote-Drift Blasting 75

How to Operate a Stoper 78

Steep Rock Today 84

Houses for Miners 86

How Anaconda Trains Employees to Work Safely and Efficiently 91

Geological Studies Can Avoid Costly Mistakes 94

Market Summary 97

Washington Reflections .. 100

News of the Industry 102

Operating Ideas 105

Equipment News 110

Personal News 118

Regional News 122

Copyright 1948, McGraw-Hill Publishing Co., Inc. All rights reserved

CHANGE OF ADDRESS

DIRECTOR OF CIRCULATION
Engineering and Mining Journal, 330 West 42nd Street, New York 18, N. Y.
Please change the address of my Engineering and Mining Journal subscription.

NAME .....

OLD ADDRESS .....

NEW ADDRESS .....

NEW COMPANY CONNECTION .....

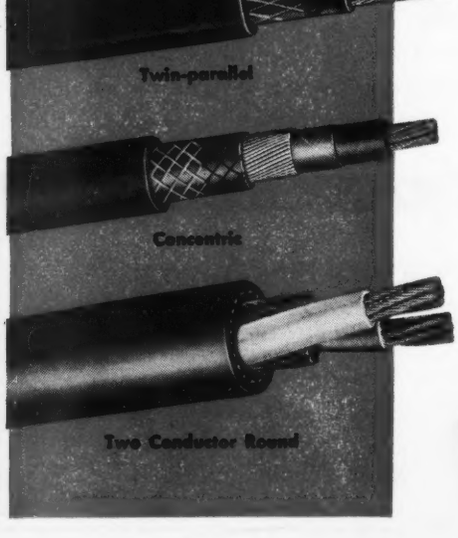
NEW TITLE OR POSITION .....

HAZARD ANNOUNCES NEW HAZAPRENE ZBF* JACKET FOR ALL HAZACORD MINING CABLES

Increasingly well-known in the mining field for outstanding flame resistance and long life, the Hazaprene Jacket is now basically improved in both of these important factors through this new formula. It's the Zinc Borate in today's Hazaprene ZBF that gives you the extra protection exemplified by the wartime performance of millions of feet in special Navy service.

All the Hazard mining cables shown and described are protected by the new Hazaprene Jacket *and at no extra cost.* In addition to the advantages provided by Hazaprene ZBF, you'll find each Hazard mining cable has its own particular service-engineered features that assure safe, trouble-free operation for years and years. Hazard mining cables carry Pennsylvania Bureau of Mines Approval.

TWO-CONDUCTOR CABLES MADE IN THREE STYLES AND WITH OR WITHOUT GROUNDING WIRES



HAZACORD MINING MACHINE CABLES

have every feature you need for dependable, trouble-free, long, safe service. Fine copper wires, rope-laid, provide a flexible, easy-to-handle cable. Strong, *heat-resisting* Hazard rubber insulation over the conductors has an operating temperature of 75°C. This gives you an extra safety margin of about 25% which withstands overload surges that tend to shorten cable life when regular Performance grade insulation is used. If cable fillers are needed, Hazard uses only Hazaprene fillers (not jute) which prevents possible wicking-in of moisture through cable ends. Vulcanized under uniform pressure Hazaprene ZBF Jacket assures you of mining machine cables that "take it" day in and day out, year after year — with unequalled safety.

HAZARD

ENGINEERING AND MINING JOURNAL

AUGUST, 1948

Reform the Mining Code

IT SEEMS AS THOUGH the controversy between the mining industry and Government over proposed changes in public mineral land administration has been going on for so long without any reconciliation of opposing views that "the memory of man runneth not to the contrary." This is nothing to which either side can point with pride, and we suggest to the industry that to continue to insist on perpetuation of the status quo is a sure way to insure being overridden eventually and losing the initiative.

Anyone who will take a reasonably objective look at the situation is bound to conclude that, although the system is basically sound, it has many ridiculous imperfections which cannot be defended in the light of modern needs. To resist all change when the Ickes termites were seeking to use land administration as a part of coordinated program of Government encroachment on the basic industries was defensible strategy. However, now that this threat has been averted and most of the termites have been widely dispersed, there is no justification for hampering progress and handicapping posterity with an outworn mining code.

As we have stated before (E&MJ, August, 1946, p. 73) the state of records under the present system is so hopelessly inadequate and complex that nobody knows who has valid mineral rights in the public domain. Prior to patenting, nobody checks on the validity of discoveries, the accuracy of descriptions, the correctness of boundaries and measurements, or the adequacy of assessment work. Thus all titles based on such loose premises are patently in jeopardy. The system is still wide open for the expensive deplorable apex litigation which has characterized many mining districts in the past. Many people operating in good faith on underground discoveries have no idea if or when they will lose their rights to some surface claim-holder. In many areas claim sitters are barring progress out of a desire to wring an exorbitant toll from those who would like to undertake development. The individual who would like to enter a mineral area cannot find a map showing which areas are validly claimed and which areas are open. Even if a map is published, the would-be operator must make a lengthy, expensive search of records to check them for assessment work affidavits, and then only by laborious field surveys can he establish the validity of claims.

Moreover, in these days of geophysical prospecting and extrapolative geological studies, the limitations of the present system are truly a barrier to progress. This kind of exploration is expensive, and in many instances must be directed at broad areas where no certainty exists of either the presence or location of valuable deposits.

The following examples may be cited as further evidence of the inadequacy of the present system:

1. Owners of massive deposits such as porphyry coppers and others have had to stake large blocks of claims on a lode-claim basis despite the fact that the deposits were neither lode nor placer types. Fortunately, and commendably so, the interpretation of mining law has been liberal enough to permit mining companies to work on this basis. However it would be better to permit mining companies to stake claims on an acreage basis with vertical boundaries as the Canadians do.

2. Western claims for consolidated bedded deposits are staked as placer deposits in one area, as lode claims in another, and acquired under the Government mineral leasing system in still others.

3. Mining companies owning adjacent properties seeking to avoid costly legal entanglement involved in the settlement of extralateral rights, have resorted to compromise agreements which establish arbitrary planes as boundaries.

4. The abuse of annual assessment work on unpatented mining claims has led some West Coast mining associations to seek effective legislative correction.

Nevertheless, the mining code is fundamentally correct because it does afford logical incentives to mineral development and encourages private enterprise. To modernize the system by curing the above defects would not impair, but would actually strengthen these attributes.

Obviously the job of modernization calls for extensive review of the defects and advantages of the present system as exemplified in case studies. It calls for objective cooperation to this end between the mining industry and the Bureau of Land Management. On a tentative basis we

suggest that a modernized system should incorporate the following features:

1. Preservation of the fundamental system of obtaining title by discovery of economic deposits or reasonable indications thereof, and retention of title by development. In a recent Senate subcommittee hearing in Denver, a spokesman for the Utah Mining Association suggested that the interpretation of the definition for evidence of discovery be liberalized to mean "any showing of mineral in rock in place that would induce the locator to spend his time and money in working the claim with the expectation of finding ore of commercial value."

2. Abandonment in new claims of the present system of extralateral rights in favor of vertical boundaries, affording underground discoveries equal rights with surface claimants. The sizes and shapes of claims as now defined by law would of course have to be changed. A period of 50 years might be given in which presently existing extralateral rights could be converted into a vertical boundary system, after which all extralateral rights should be extinguished. If this should prove unfair to mines now operating under the protection of extralateral rights, provision could be made to exempt them from these provisions but affording them the option of accepting them if desired. In certain areas mining companies have prudently flanked their apex claims with a sufficient number of parallel claims so that it would be to their advantage to accept the vertical boundary option.

3. Setting up a basis for large-area temporary claims to encourage geophysical prospecting and extrapolative geological exploration.

4. Official inspection of discovery claims and assessment work, and surveying of boundaries, free or at low cost, with the guarantee that official approval of these items assures their legal validity.

5. A 25-year limit on unpatented claims with the option of paying rentals in lieu of assessment work after the existence of economic or near-economic mineralization has been established.

6. Denial of patents where commercial operations have not been undertaken.

7. Maintenance in county offices of maps showing the locations of valid claims.

We urge that under Government auspices a committee with strong industry representation should be set up to recommend a modernized mining code to Congress. The committee should be provided with appropriate technical and clerical staff at Government expense.

Undoubtedly the above proposals will provoke a certain amount of healthy controversy, particularly because our industry is zealous in maintaining the recording of unpatented claims in local offices, and the present status quo in general. We believe that the system of local recording is sound and desirable, but that it should be revamped to wipe out the questions which now exist as to the location and validity of unpatented claims. Under the paramount Federal mining code, mining states or even counties have the right to enact rules or laws to insure this end. In regard to the other proposals outlined above, we hope that they will stimulate a more systematic exploitation of our mineral resources under the free enterprise system, and at the same time remove the basis for arguments which have been advanced in the past in favor of wider Government controls over mineral lands.

Are Basing-Point Systems Doomed?

DESPITE PREDICTIONS freely made on all sides that "basing-point systems are finished," or that "any type of basing-point formula is ruled out," we believe that the mining industry would be well advised to think long and carefully before undertaking any change in the pricing systems that have served the non-ferrous metals industry so long and so well.

True, the Supreme Court's decision in the cement industry case, followed by U. S. Steel's abandonment of basing-point pricing suggest a tide running strongly against time-honored methods. Many commentators have yielded to temptation and are seeking to bolster their reputations as soothsayers by predicting a reversal of all business pricing practices. Unfortunately, forecasting the future of the basing-point system is not that easy.

For one thing, no sweeping generalization can be made, simply because each industry is a special case that must be considered as such. The Federal Trade Commission cannot, and will not attempt to, give an industry or a single business unit an opinion as to the legality of its pricing methods. One can derive his own opinion, based on the decisions that have been handed down, but few such opinions will be found to agree.

For example, one court decision has held (in the "crepe paper" case) that a company should at least try to give its nearby customers a lower price than its distant customers. On the other hand, a trial examiner for the FTC, in considering

a lead pigment case, ruled in favor of a delivered-price system. He held that Section 2 of the Clayton Act calls upon producers to protect their customers from unequal costs so that they may compete on equal terms among themselves. This case is now pending before the FTC.

However, the weight of evidence does indicate that the FTC is bent on eliminating pricing systems that result in quotation of identical delivered prices to a single consumer by several widely scattered producers. Therefore, it would be unwise to encourage a belief that the mining industry's pricing habits need never be changed. Yet we think it would also be unwise to upset the industry's pricing methods needlessly. In this case, there is no penalty for delay.

Note that in Mr. Fairless' statement announcing U. S. Steel's decision, he referred to the cement industry's pricing system as "generally similar to that now in use in the steel industry." In that belief, and in view of the Supreme Court's decision in the cement case, U. S. Steel had little choice but to drop the basing-point system. Unless non-ferrous producers can feel equally sure of the similarity of their pricing methods to those used for cement, the need for action does not seem urgent.

We know that non-ferrous metal producers are, indeed, studying this problem, and that they will be prepared to defend a pricing system they want to maintain, if the need should arise. We know also that such a study is most complicated, owing to increased freight rates, inflated prices, and abnormal demand for metals, but some attempt at it must certainly be made.

Our feeling, however, is that any immediate upsetting of established pricing practices would be most unfortunate because of the resultant compounding of an already confused situation, and because of the strong possibility that such an upset would only add to the already dangerous inflationary pressure on metal prices.

Housing Is Part of the Job

AS THE ARTICLE, "Houses For Miners" in this issue will demonstrate, both the Bunker Hill and the Sunshine mining companies are to be congratulated on performing a real service to their communities. They have done more than merely build houses in the hope of attracting more of the underground miners they badly need. They have taken pains to plan these houses well, build them economically, and handle their distribution equitably.

That this is true, unquestionably arises out of the innate fairness and sense of community responsibility characteristic of J. B. Haffner, general manager of Bunker Hill, and Ross D. Leisk, Sunshine's general manager. The fine new houses going up in the Kellogg district in the Coeur d'Alenes stand as visible proof of the pride these men take both in their companies and in the place where they work and live.

Nor is that all these houses show. They will prove that, even in the these days of high costs and scarce labor and materials, mining camps need not have so many houses for which one must apologize. This is not true of all mining towns; but in far too many communities, the only houses now available were built in the late Eighties, or look as though they were.

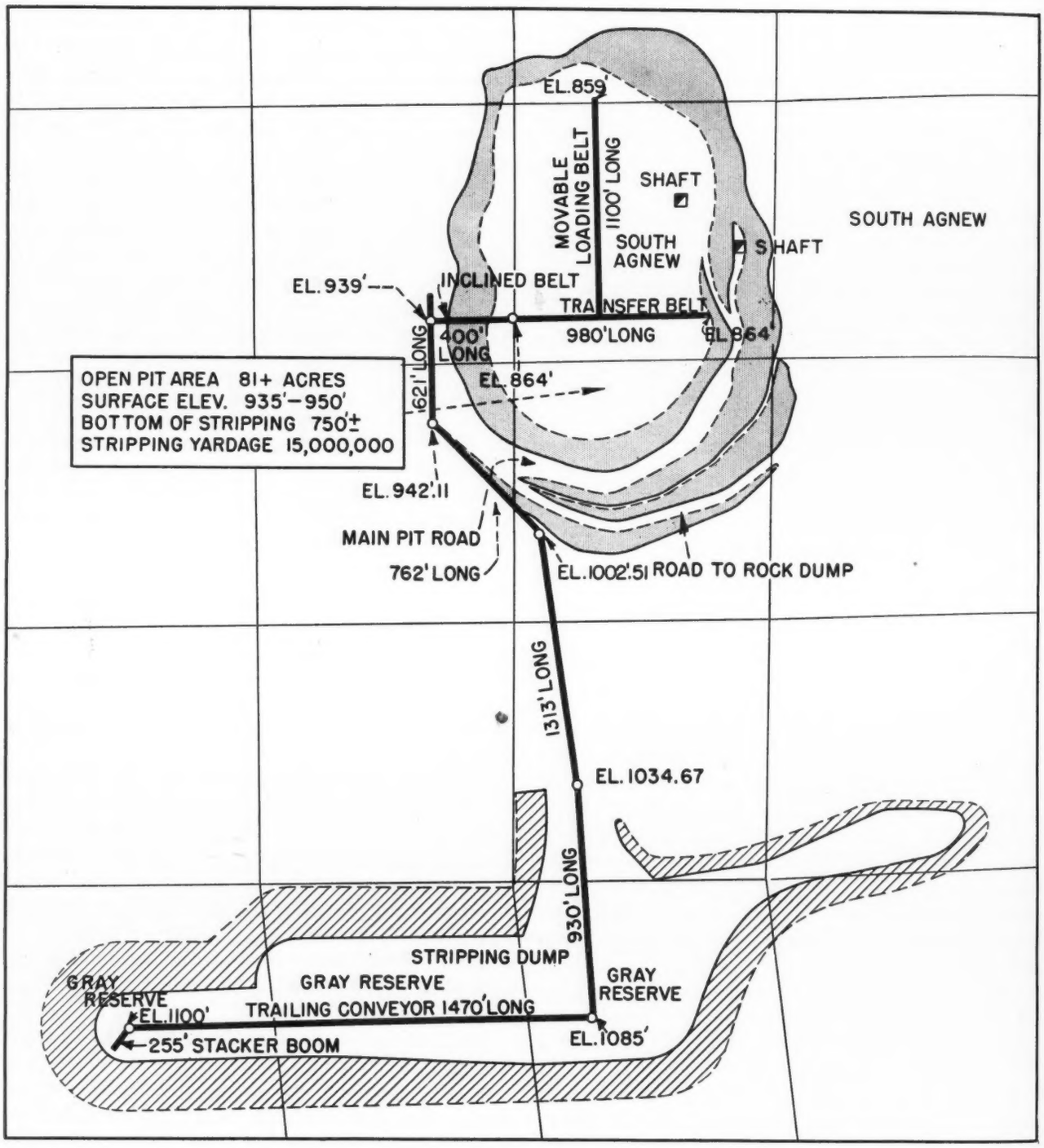
This situation is certainly not one to inspire confidence in a prospective employee, especially if he is a family man. Only by helping to make mining towns a better place to live can companies begin to count on attracting and holding, the steady, competent, self-reliant kind of man they like best.

But even this is only part of the job. A lack of houses does not altogether explain why it is that there are almost invariably enough men for all the surface jobs around a mine, and never enough for the jobs underground. This hard fact is true in almost all of this country's mining districts, east, west, north and south. Men, considered as a group, don't seem to like underground work, and a lot of production is being lost through that dislike.

The real problem, then, is to get men to want to work underground, by whatever means are effective. One obvious way is to offer men more money for underground work, and we believe that this avenue has been, and is being, thoroughly explored. Another way is to make underground mines better places to work, and one can still do a lot in most mines to improve the tools, the supervision, and the various incentives that keep men working.

Job training for young men gives the best possible chance to lead men into mining carefully and safely, taking pains the while to build up in them an affection for the job and the pride in the technique of mining that its complex exacting nature really justifies.

That, then, is the two-fold job before the mining industry. To build communities that miners can be happy to live in; and to build jobs that they will be both willing and proud to hold.



CONVEYOR SYSTEM between dragline and dump is indicated by heavy black line.

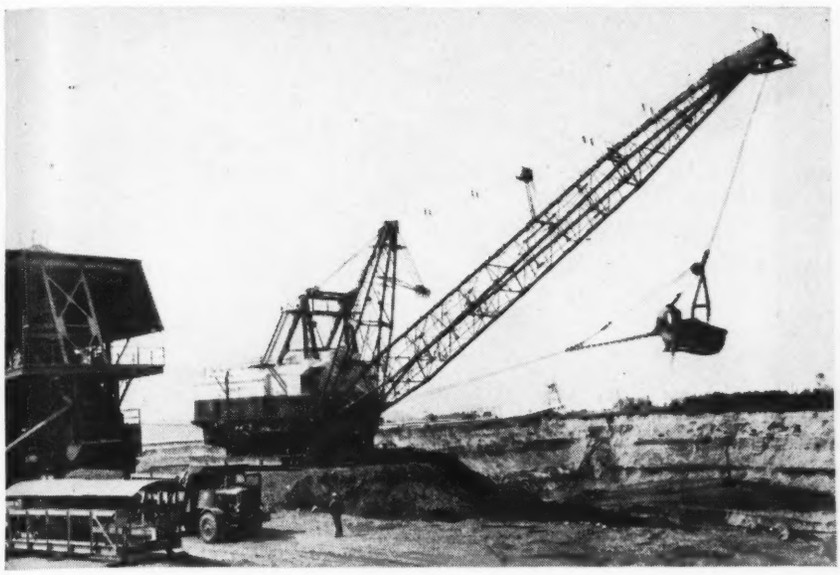
South Agnew Stripping Scheme

Over 5,800 ft. long at start, with ultimate length of 9,831 ft., the new system will handle stripping spoil dug by 25-cu.yd. dragline

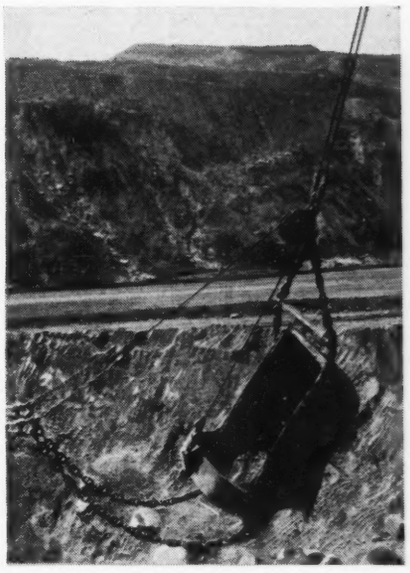
EARL S. MOLLARD and H. E. REESE
Manager of Mines Superintendent, Hibbing Dist. Mines
Butler Brothers, Cooley, Minn.

DISPOSAL OF OVERBURDEN removed in stripping operations presents a growing problem on the Mesabi iron range. The ground chosen must be near enough to the mine to give a reasonable transportation cost and must contain no ore that is likely to require mining at some future date.

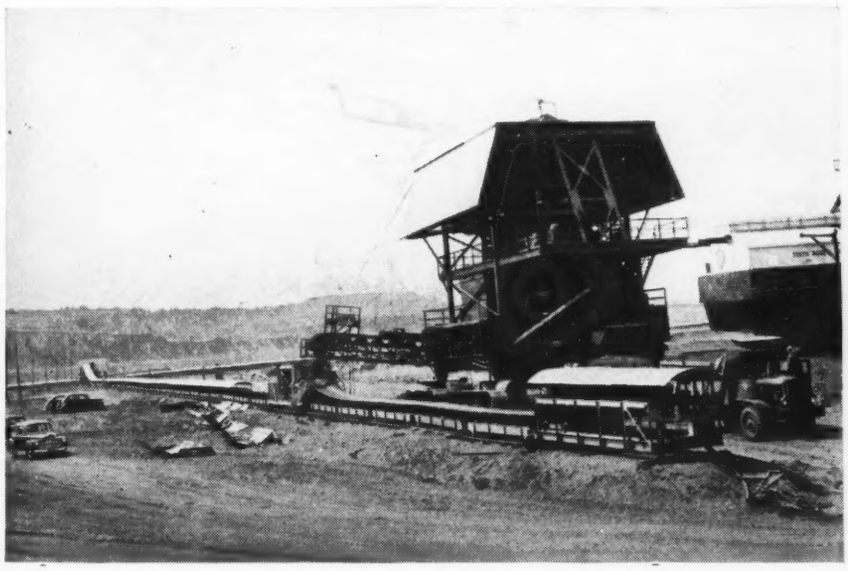
Butler Brothers has met this



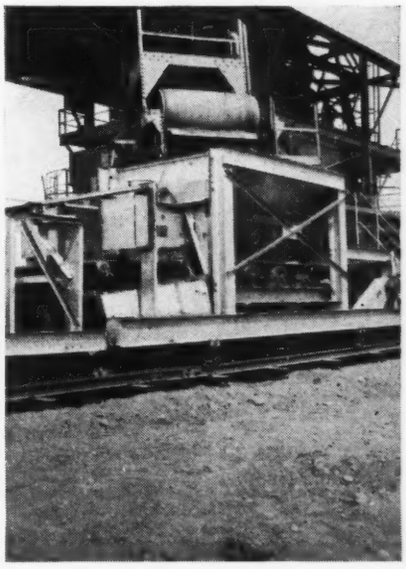
1 MAMMOTH WALKING DRAGLINE is making first cut in stripping South Agnew property. From toe of bank on which it stands to center line of movable loading conveyor, end of which is seen in lower left, is 270 ft. The bucket will dump its load of overburden into hopper of screening plant at left. Huge in dimensions. . . . .



2 THE BUCKET weighs over 31.5 tons, holds 25 cu.yd. From the crawler-mounted screening plant, to the hopper of which the bucket delivers its load. . . . .



3 SCREENED UNDERSIZE is delivered by boom conveyor to traveling hopper which moves along skid-mounted loading belt as stripping progresses. Oversize rocks go to a bin to be taken away by truck (lower right). In distance, loading belt discharges to first section of transfer conveyor. To cushion impact of undersize falling from boom conveyor. . . .



4 RUBBER-COVERED IMPACT IDLERS support loading belt as it passes beneath hopper. Operation of screening plant is controlled from . . . . . (See next page)

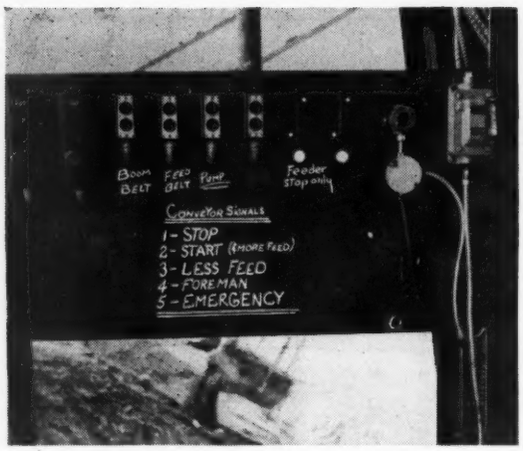
Unique in Mesabi Practice

problem on the South Agnew property, four miles from Hibbing, by digging the overburden with a 25-cu.yd. dragline and loading it onto a conveyor system, which at the outset is 5,851 ft. long, via a screening plant to remove large rocks. The stripping dump that will be built is shown on the map.

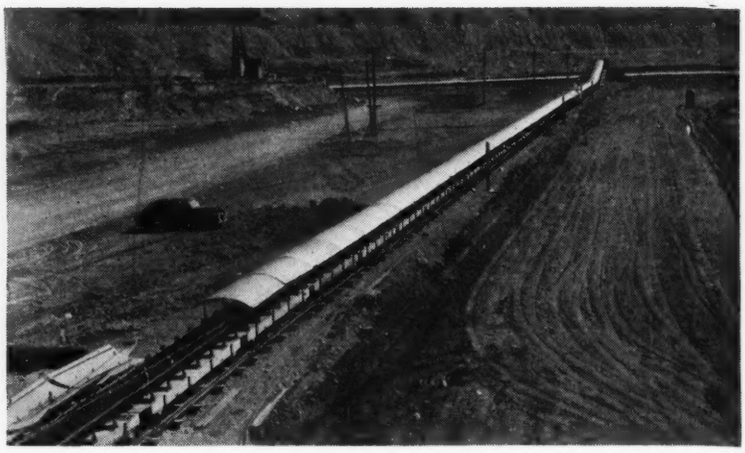
An accompanying table gives data on the big dragline, which has its counterpart only in the pebble phosphate field of Florida and at certain strip coal mines. Other tables present data on the screening plant and conveyor system. A map gives the plan of the conveyor layout. Dragline and screening plant began working three shifts on May 31 of this year, the work of assembling having begun Oct. 1, 1947.

The screening plant, shown in the photos, is 48 ft. high and is mounted on the base of a model 550-B 21-cu.yd. shovel. It has individually-powered caterpillar tracks

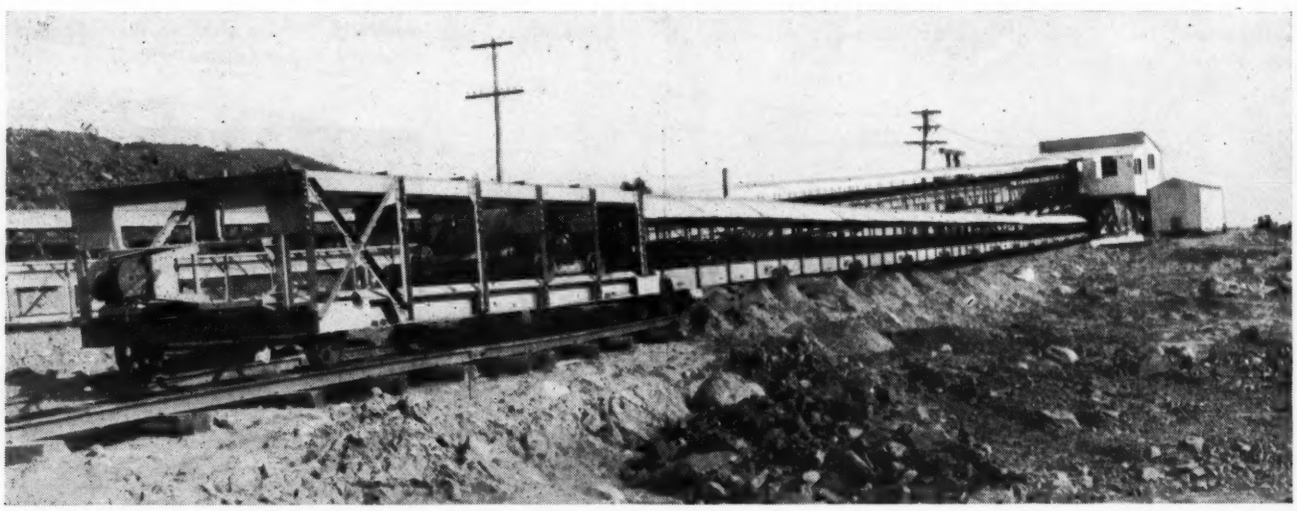
(*Turn to page* 74)



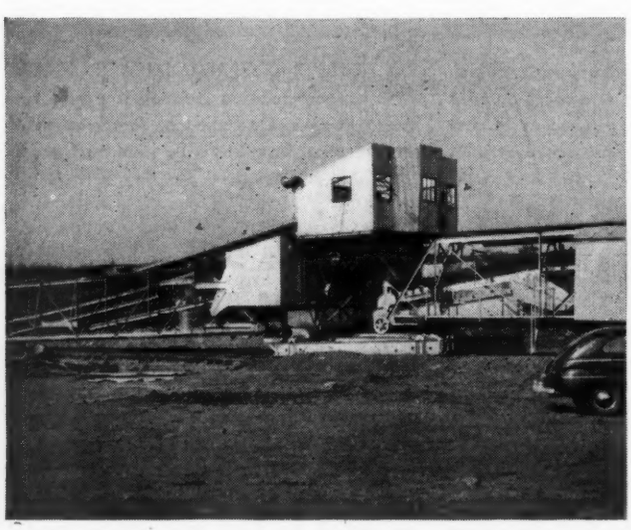
5 PANEL of push buttons on deck of screening plant in keeping with up-to-date practice. Devices are provided for keeping the plant level at all times. From this deck may be obtained . . .



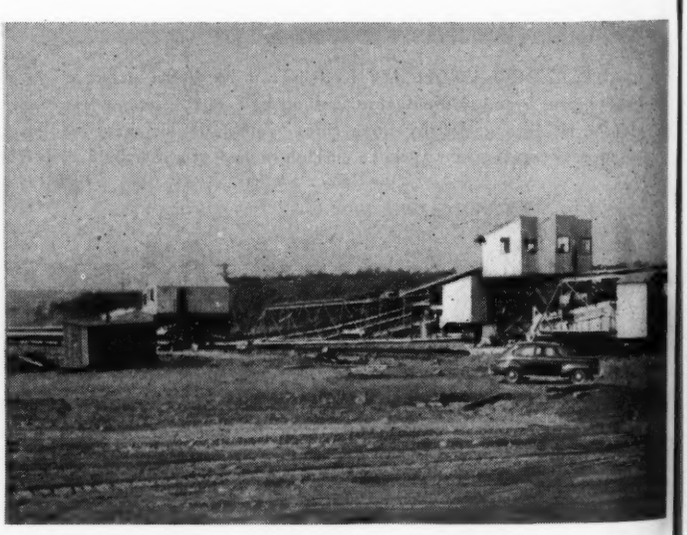
6 ANOTHER VIEW of movable loading conveyor. Ground to right is to be stripped in first cut made and ground to left in second cut. In left background is old No. 3 South Agnew shaft. The transfer belt, consisting of six sections, delivers finally to . . . .



7 TRAILING CONVEYOR, here seen in foreground. This is mounted on rails and extends through transfer station in distance (where it receives its load from last section of transfer conveyor) on to the point where it delivers its load to the stacker. The latter is 245 ft. in length and pivots on . . . .



8 THE ELECTRICALLY-OPERATED CIRCLE. From this the stacker can swing 180 deg. at 15 fpm. at its discharge end, spreading dirt over end of dump. At stacker's mid-point . . . .



9 CRAWLER TRACKS support it as seen in the extension of this picture to the right. Two electric motors provide the propelling power for the treads. This view, starting at the left, shows the point

Facts About Equipment Installed for Stripping South Agnew Property

Data on 1150-B Dragline

Working weight .....2,420,000 lb.
Ballast (iron ore)..... 275,000 lb.
Base diameter .....44 ft.
Base bearing area.....1525 sq.ft.
Base ground pressure.....11 psi.
Walking shoes .....8x48 ft.
Total area of shoes.....768 sq. ft.
Ground pressure of shoes...21.9 psi.
Overall width outside shoes....65 ft.
Length of step.....7 ft. 6 in.
Walking speed .....0.11 mph.
Boom length .....180 ft.
Hp. M-G set .....1750 hp.
Hoist motors, 2.....425 hp.
Drag motors, 2.....425 hp.
Swing motors, 3.....125 hp.
Voltage input .....4000 v., 60 cycles
Hoist pull.....
(stalling condition) .....232,000 lb.
Hoist speed (loaded).....350 fpm.
Hoist speed (lowering).....660 fpm.
Drag pull .....
(stalling condition) ....260,000 lb.
Drag speed (at 75% of stall) 250 fpm.
Drag speed payout.....540 fpm.
Allowable suspended load..133,000 lb.
Bucket size, inside..9 ft. 4 in. wide x 7 .....ft. deep x 13 ft. 6 in. long
Bucket weight .....63,220 lb.
Bucket capacity .....25 cu. yd.
Maximum digging depth.....
30 deg. .....110 ft.
Dumping height, 30 deg..... 73 ft.
Maximum digging capacity.....
.....1700 cu. yd./hr.
Practical digging capacity.....
.....1120 cu. yd./hr.
Estimated digging capacity.....
(hopper dump) ....1010 cu. yd./hr.
Overburden, maximum depth..190 ft.
Overburden, average .....160 ft.
Average width, proposed dragline cut .....230 ft.
Distance from c/l dragline to c/l screening plant.....170 ft.

Screening Plant Data

Total weight, empty.....1,093,065 lb.
Size of caterpillar tracks.....
..... 8-36-in. x 13 ft. 6 in.
Total ground bearing area..324 sq. ft.
Ground pressure, average empty
.....23.43 psi.
Traveling speed .....0.2 mph.
Feeder size .....7 x 18 ft.
Screen size .....7 x 12 ft.
.....(13 x 17-in. openings)
Transfer conveyor.....2-60 in.
Propelling motors, 4.....50 hp. each
Total connected hp.....342
Overall height .....48 ft.
Hopper opening, size.....30 x 28 ft.
Distance c/l screen plant to....
.....c/l loading conveyor 35 ft.

Conveyor Data

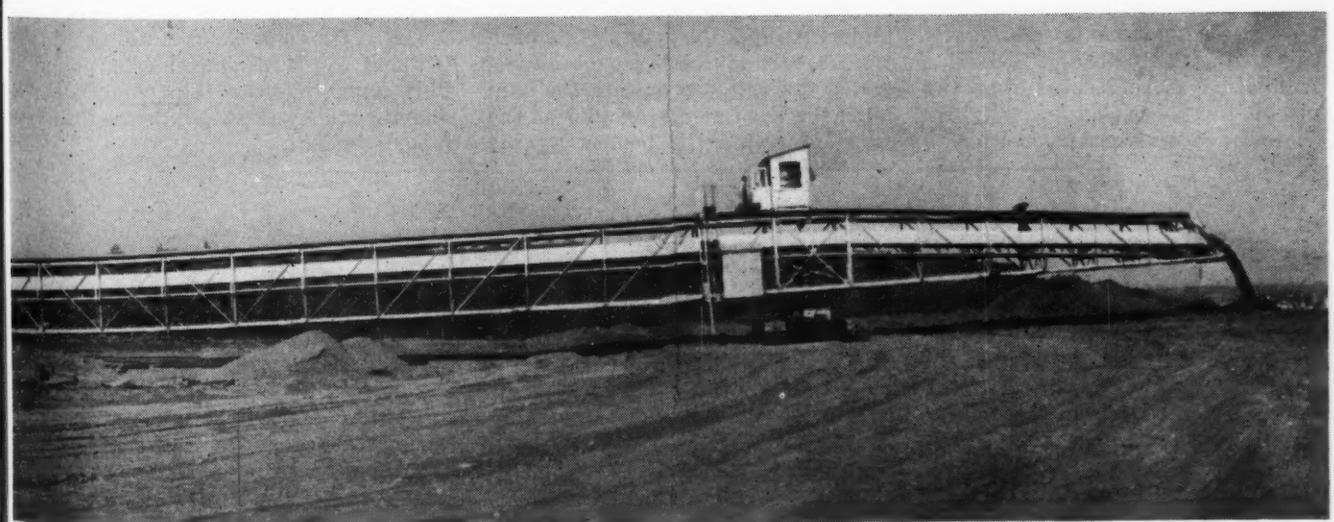
Belt, 6-ply, 48-oz. duck. Top cover 3/16 in. Pulley side 1/16 in. Pulleys, head, 48 in., rubber-lagged. Tail and take up, 36 in. Snub 30 in.
Belt width .....48 in.
Overall length, c. to c., initial.5,851 ft.
Overall length, c. to c.,.....
ultimate .....9,831 ft.
Speed .....550 fpm.
Maximum capacity...1,000 cu.yd./hr.
Total connected hp., initial.....1,725
Transfer points, number, initial. 7
Total lift, initial.....128 ft.
Troughing idlers, number.....2,258
Return, idlers, number..... 814
Traveling hopper, hp..... 2

Data on Stacker and Trailing Conveyor Truss

Belt width .....48 in.
Belt speed .....650 fpm.
Trailing conveyor, ...
initial length .....1160 ft.
Trailing conveyor, ...
ultimate length .....2300 ft.
Stacker length ..... 245 ft.
Total weight, stacker and trailing conveyor truss, loaded..420,800 lb.
Live load ..... 88,000 lb.
Stacker conveyor, hp.....200
Stacker propelling hp., 2.....
.....15 hp., 30hp.
Stacker propelling speed....15 fpm.
Trailing conveyor hp.....300
Trailing conveyor propelling hp., 2
.....5 hp., 10 hp.
Ground pressure stacker crawler treads .....12 psi.

Grades in Conveyor System

Belt.	Length, Ft.	Difference of Elevation, Ft.	Grade %
Loading Belt	1100	5	+ 0.45
1st. Section, transfer belt.....	980	0	10.00
2nd. Section, transfer belt.....	400	75	+ 18.75
3d. Section, transfer belt.....	621	3.1	+ 0.50
4th. Section, transfer belt.....	762	60.4	+ 2.00
5th. Section, transfer belt.....	1313	32.2	+ 2.45
6th. Section, transfer belt.....	930	50.3	+ 5.40
Trailing conveyor	1470	15.0	+ 1.02



where the transfer belt delivers the dirt to trailing conveyor, the transfer from latter to stacker, also entire length of stacker.

CONTINUED ON NEXT PAGE

on each corner and can be moved in any direction. It is kept level at all times by means of a leveling device. The hopper that receives the dirt is 30x28 ft. A feeder, 7x18 ft. in dimensions, carries the dirt to the Simplicity vibrating screen. The accompanying table on page 73 gives additional data.

In June, soon after the South Agnew installation was started, screening was being done through a 10½x18-in. opening in a semi-grizzly type of screen. Experimentation was in progress to determine the best size of hole. The screen oversize goes to a pocket and the undersize via a short 60-in. belt to a 40-ft. boom conveyor which delivers to a hopper. This feeds the first section of the conveyor system, 1,100 ft. long, along which the hopper can be moved on rails. This 1,100-ft. section is shown on the map as the movable loading belt. The belts are of Goodyear make and the idlers are by Jeffrey. Motors and speed reducers are made by Westinghouse and Link-Belt respectively. The starting equipment is of General Electric manufacture.

The first cut now being taken by the dragline west of the movable belt will be roughly 1,000 ft. long and 270 ft. wide, east and west, from the toe of the cut to the center line of the belt. The overburden is being taken in two lifts, the present one being 70 ft. deep. The second lift will vary from 70 to 100 ft. in depth. When the second lift is finished, completing the first cut, the movable conveyor will be pushed parallel to itself 270 ft. east and the second cut will be taken. These two north-south cuts of two lifts each will complete the stripping of the ground north of the east-west transfer belt (see the accompanying map).

South of the transfer belt, four east-west cuts will be taken, each 240 ft. wide. This will complete the stripping on this job.

The movable loading conveyor is skid-mounted on steel ties. The decking that supports it consists of 18 sections, there being a 2-ft. gap between each. There is also a 2-ft. removable piece between the rails on which the loading hopper runs. When the time comes for moving the conveyor, the 2-ft. pieces will be taken out, to increase the flexibility of the line, and the conveyor will be pushed sideways by bulldozers to its new position.

At the dump, the sixth and last section of the transfer division of the conveyor transfers its load to the so-called trailing conveyor which extends across the ground selected for the dump. The supporting structure of this conveyor is mounted on flanged wheels which move on rails and ties. The trailing conveyor can be extended as the dump builds ahead by adding sections of ties, rails and supporting structure at the rear end, as may be necessary.

The trailing conveyor delivers the dirt to a stacker 245 ft. long which swings on an electrically-operated circle and will spread the dirt over the end of the dump. At its midpoint the stacker is supported on a set of 54-B crawler tracks having two electric motors for propelling power. The stacker can travel in a half circle at 15 f.p.m.

Inasmuch as the crawler treads cannot track easily on a fixed radius, 7 ft. of leeway is built into the stacker's pintle support. Limit switches are provided to cut out traction if the operator risks overrunning this allowance, thereby possibly damaging the trailing conveyor which connects with the stacker. Devices for keeping the stacker level are also provided.

Photo-Electric Cell Used to Check Dials on Skip Hoist

AT THE INLAND Steel Co.'s Sherwood mine, on the Menominee Range, near Iron River, Mich., an electric eye has recently been installed in the shaft, according to Richard O. Marsten, assistant superintendent. The beam of light shines horizontally across the two hoisting compartments, and is received by a photo-electric cell. The installation is so located that the top of the 6-ton skip is slightly below the beam when in position to be loaded from the measuring pocket on the 1200-ft. level. A small light in the hoisting engineer's panel on top, which is normally off, goes on when the beam is intercepted by either skip.

This device is used to check the skip-spotting dials on the skip hoist, and *not* to spot the empty skips each time ore is hoisted. To check his mark, the engineer lowers the skip until the light comes on just as the skip intercepts the beam. As the skip continues downward, the light goes off again and that point should coincide with his mark on the dial.

By occasionally checking the marks with this electric eye the hoisting engineer can quickly make any adjustments that may be necessary due to rope stretch or other causes. Thus he is able to avoid spotting the skips improperly, possibly damaging the skip chairs or causing spillage. P. D. Pearson is superintendent.

Oxygen Shows Advantage in Metallurgical Work

TESTS ON THE USE of oxygen-enriched blast in slag fuming and lead blast furnace operations of the Consolidated Mining and Smelting Co. of Canada, Ltd., Trail, B. C., have proceeded since April, 1947, according to R. R. McNaughton, manager, metallurgical division. A small but continuous supply of by-product oxygen is available from the electrolytic hydrogen plant.

The effect on slag fuming is to increase the rate at which zinc is fumed, by increasing the temperature of the slag while maintaining the required reduction conditions. Enrichment to 22.3% oxygen, by volume, in the blast has lowered the zinc in the waste slag from 2.5 to 1.6%.

In the lead blast furnaces, the effects have not been so accurately measured, but observations show the following potential benefits: (1) Reduction of the coke on the charge; (2) an increase in slag temperature; and (3) an increase in tonnage of furnace-charge throughout.

In both operations, a stage has been reached where construction modifications are indicated to counter higher temperatures prevailing.

Glory-Hole Operation Uses Coyote-Drift Blasting

MILLARD L. REYNER
Engineering Department

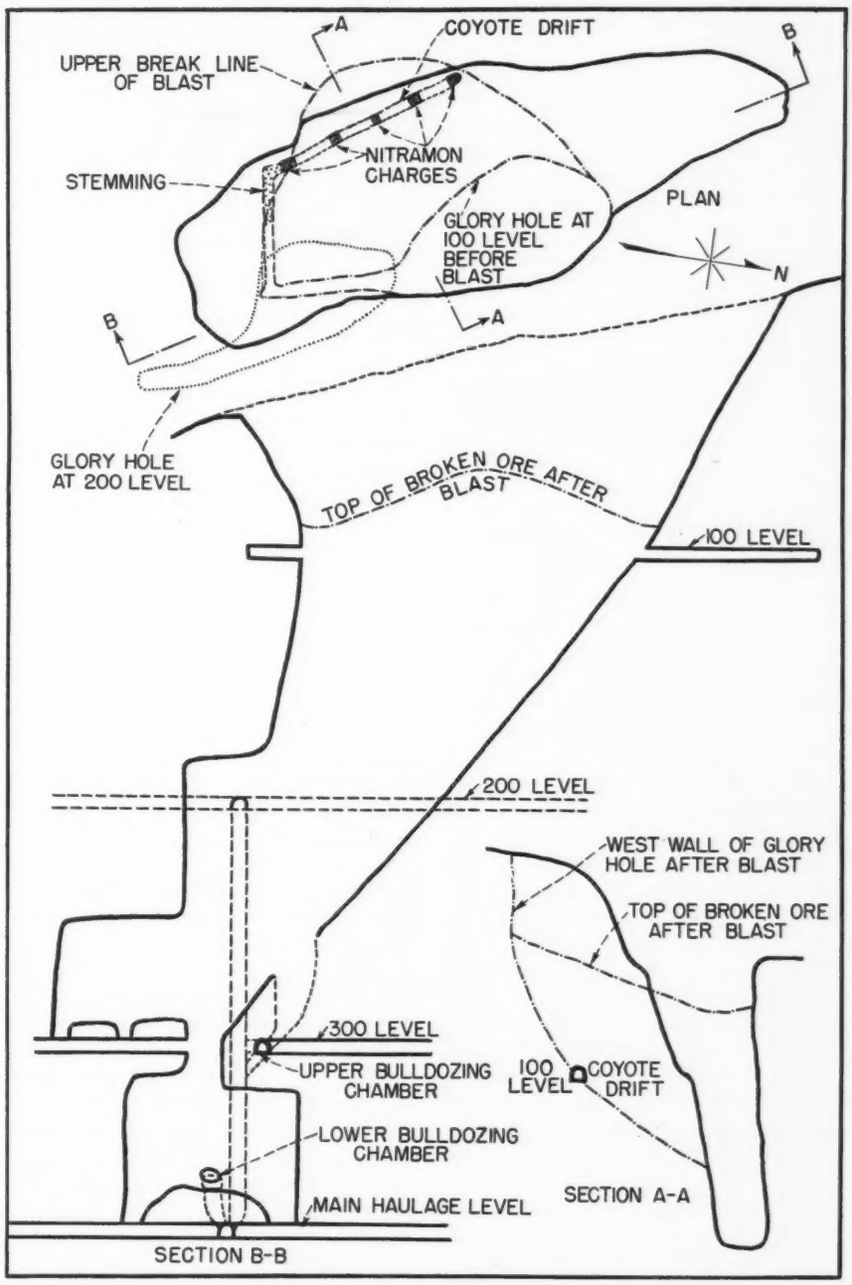
EDGAR A. SCHOLZ
General Manager

PAAVO P. PUUMALA
Engineering Department
Ruby Gulch Mining Co.
Zortman, Montana

DEVISING A MINING METHOD that would supply ore from open glory holes for winter operation, when day by day ore production had proved impractical, was the problem confronting the Ruby Gulch Mining Co., Zortman, Mont., in the spring of 1947. The problem was solved by adapting coyote-drift heavy blasting to glory-hole mining. More than a year's supply of ore for gravity drawing was produced by this method at a cost of $0.0546 per ton. Consequently increased production reduced operating costs below $1.60 per ton.

Dwindling financial reserves at the close of World War II forced the company to reopen its gold property. However, rising costs of labor and supplies indicated that profitable operation would be impossible if prewar mining methods were used. Operations before the war had been based on selective mining of higher grade ore, during which a large tonnage of low-grade material was produced by pulling rock that caved into the narrow shrinkage stopes previously emptied. Some mining in the open stopes was done with jackhammers, and the walls of the Alabama mine sector were slabbed off several times. Combination of these methods developed four major glory holes—namely, the Ruby, OK, Independent and Alabama. The Ruby, largest of the group, is 900 ft. long, nearly 400 ft. wide, and 300 ft. deep. It was developed almost entirely by pulling the rock from small chutes as it caved into the stopes.

Experience gained from these operations, together with available assay records, pointed toward the possibility of evolving a modern, low-cost mining operation to permit extraction of the large, low-grade

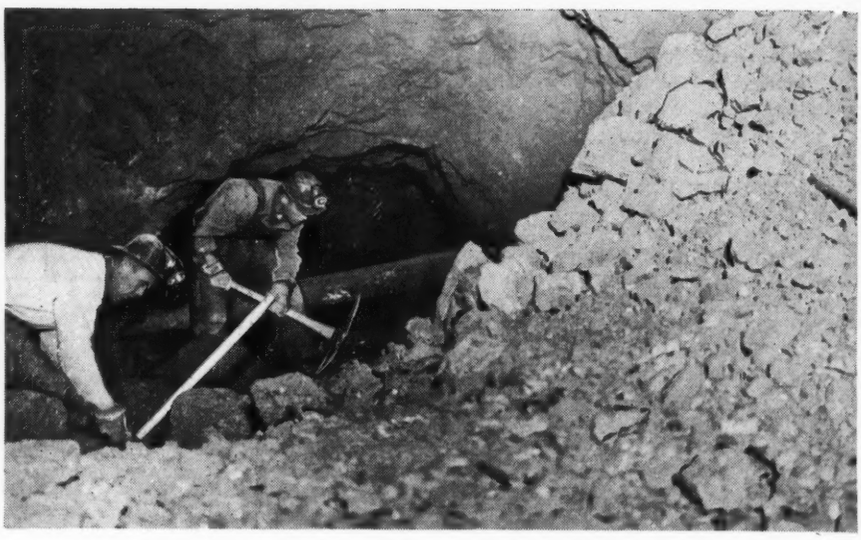


PLAN AND VERTICAL SECTION of Alabama glory hole where coyote-drift blast using a 30,000-lb. charge of powder broke 130,000 tons of ore at a cost of 5.46c. per ton

blocks of ore present. Accordingly mining was resumed on July 1, 1946, with jackhammers at two of the glory holes mentioned. Narrow benches 9 to 10 ft. high were found to be best. A combination of ravelly ground and mud seams made deeper drilling costly. Wagon drills on wider benches with a bulldozer to push the rock off the bench did not lower costs because of these difficult drilling conditions. Average ore production per man shift for all pit miners and muckers was 50 tons. Direct mining costs obtained were 50c. per ton. DuPont bag-packed No. 2D powder gave satisfactory fragmentation and reduced loading

time to a considerable degree.

Because of adverse factors and difficult working conditions during the winter of 1946-7, production per man was low. Servicing of working places was expensive, and freezing of the mixture of broken ore and snow in the transfer system made production from the glory holes exceedingly difficult. To prevent recurrence of these difficulties, adoption of a different mining method was necessary. The largest and most readily available ore reserve was situated on the west wall of the Alabama glory hole. (See illustration.) This opening measured 400 ft. in a north-south direction and averaged 80 ft. in width, gradually becoming smaller with depth. At the north end the glory hole was 100 ft. deep, from which point it rilled southward to a depth of 340 ft. below the surface at the south end. Large open stopes connect the glory hole with the main haulage level 500 ft. below the surface.



UPPER BULLDOZING CHAMBER on 300 level. Tonnage put through grizzlies averaged 45 tons per man per 8-hr. shift. Miners shown are Loran Rummel (left) and Harold Brown.

Coyote Method Selected

To provide the large tonnage required for winter operation from the west wall of the glory hole the coyote-drift heavy-blast method was selected as being best for the job. Essentially, the problem amounted to use of coyote-drift blast situated well up on the face of a cliff instead of at the toe, as is more common. R. C. Sherman, technical representative, du Pont Powder Co., furnished useful data on recent practice in coyote-drift blasting in quarries. Based on this information, a 35-ft. crosscut in the west wall of the glory hole was used as a starting point. Following pit and quarry experiences, wherein coyote drifts are located back of the pit face by a distance equal to about 60% of the vertical height above the drifts, the cross-cut was driven westward until the face was 60 to 65 ft. back of the pit west wall. This distance was found to be correct because the drift averaged more than 100 ft. below the surface.

The coyote drift was driven 142 ft. northward from the end of a crosscut roughly parallel to the west wall of the glory hole. This length was chosen because it allowed use of a full minimum carload of 30,000 lb. of Nitramon C, the explosive selected for the job. The drift was loaded under the direction of Mr. Sherman. Five equally spaced charges were placed as shown. The two end charges contained a 60% heavier load than the three charges spaced equally between them because of the extra force required to break the thicker burden of rock at the ends of the drift.

Cans of Nitramon, 7½ in. in diameter and 24 in. long, were stacked in the drift in as compact a group as possible until the calculated weight of explosive was in place. Two primer cans were stacked with the other cans in each charge so that one would be near the center of the stack at the top and the other at the bottom. Primacord was attached to the primer cans by means of convenient metal tunnels on the side of each can. A double line of Primacord was run down the drift and out of the crosscut to the portal. Primacord cross ties were made every 5 ft. As each succeeding charge was placed, Primacord connected the primer cans to the main trunk lines. To make sure that the five charges would explode, a single line of Nitramon cans was laid end to end between them.

No stemming was used between charges, but sacked tailings were packed from the last charge to the crosscut and 36 ft. toward the portal of the crosscut. Loose tailings were packed into all voids. Stemming length totaled 44 ft. At the portal, two main Primacord lines were tied together, and one line was continued to the surface where a No. 6 fuse cap with 15 ft. of fuse attached was taped to the Primacord, to serve as a detonator.

The powder drift explosion was unspectacular. No noise of the explosion was heard, and the ground tremor accompanying the shock was unexpectedly small. Broken ore filled the glory hole 50 ft. above the coyote drift level on the west side, sloping down toward the east wall of the glory hole. Only a small number of large rocks up to 5 ft. in diameter were visible on the surface of the broken ore.

The actual break line of the blast adhered closely to that calculated. As the downward break of the shot was inaccessible, the theoretical 45-deg. break angle of the shot down from the perpendicular to the preblast face was assumed, except in the north end, where the bottom of the glory hole prevented such extensive down break. In this section it was assumed that the blast broke to the bottom of the pit. Adding the volume obtained from the down break, using these assumptions, to the accurately computed volume above the coyote drift level, the total was 130,000 tons. Total cost of putting the broken ore in the glory hole was $0.0546 per ton. Powder consumption per ton was 0.237 lb.

To draw the broken ore, two grizzly and bulldozing chambers were developed, one on the 300 level and the other just above the main haulage level, 100 ft. lower. Existing mine openings were used to keep the cost of preparing both chambers at a minimum. The lower chamber was located essentially on the main haulage level to provide maximum flexibility in use of haulage and tramming crews. Depending on how fast both bulldozing crews were able to put ore through the grizzlies, the main haulage level bulldozing crew may load trains part of the time, do necessary repair work, or work full time in the bulldozing chamber. The upper or 300 level chamber has several ad-

GRIZZLY on 300 level constructed of 90-lb. rail on 13½-in. spacing. About 10% of ore required secondary blasting. Powder used for this purpose was 0.3 to 0.4 lb. per ton.

vantages over the haulage level set-up, foremost of which is the storage capacity of about 500 tons below the grizzly. This allows fine material to run continuously until the grizzly is choked with large rock rather than only until the relatively small storage capacity of 25 tons below the lower chamber is filled.

Production through these grizzlies is limited by the small size of grizzly openings that must be maintained to feed the primary crusher which can only handle rock up to 12 in. in size. Best overall results were obtained with 13½-in. mine grizzly spacing and 11½-in. spacing on the mill grizzly.

Severe impact of large boulders and jarring caused by secondary blasting have at times made maintenance of grizzlies difficult. Slushing rock to the grizzly improved matters materially, but with large boulders the small slusher available proved inefficient. Large slushers should work to advantage in such a place. However, records showed a loss in production of 30 tons per shift for a two-man crew using the small slusher as compared to the same men working on a grizzly to which ore was fed by gravity. Consequently gravity feed was adopted. Both rail and pole grizzly bars have been tried, each having favorable points. Pole grizzly bars (12-in. used green stulls) are easier to replace and to work on, but the 90-lb. rail grizzly permits greater production. In both cases, best results are obtained by shortening the span between cross supports and by making the bars only long enough to reach from one support to the next rather than spanning the full length.

Improved technique has increased production per bulldozing chamber operator to more than 45 tons per 8-hr. shift. Boulders are broken with hammers and by blasting, either blockholing or plastering. Fuse caps or electric detonators are used, depending on the situation prevailing, firing from one to ten shots in a set. Powder consumption averages 0.3 to 0.4 per ton of rock.

It is estimated that up to 10% of the ore produced is subject to secondary blasting. Boulders from one to three feet in size are most common, and 6-ft. boulders are relatively few.

When high hangups are encountered in finger raises, blasting poles are required to place the "bomb." No difficulties are experienced in removing lower hangups or those in the throat area of the finger raise. About half the powder used in the bulldozing chambers is for freezing hangups.

The upper and lower bulldozing chamber loading chutes are conveniently situated about 100 ft. apart on the main 1,800-ft. crosscut to the portal, whence an additional 1,300 ft. of track leads to the mill coarse-ore bin. Conventional chutes 4 ft. wide load 2-ton side-dump cars. A trolley locomotive hauls 7-car trains to the mill.

The ore is crushed to minus ½-in. by rolls and goes to 300-ton sand leaching tanks. Both gold and silver are recovered by cyanide leaching, but gold is the principal value.

Results obtained through coyote-drift blasting operation are as follows: 1. Ore has been produced successfully throughout the winter. Freezing has caused no difficulty. 2. Ore was broken into the glory hole during summer seasons of short labor supply. 3. Production has been increased from 275 to 375 tons per day through improved methods, and by taking advantage of the more plentiful winter labor supply.

Although it has not been possible to reduce the cost per ton of placing the ore into the loading chutes, the increased volume of production has lowered overall operating costs. With the aid of several improvements in ore handling, total operating costs of less than $1.60 per ton has been obtained in recent months.

Other observations of interest are as follows: 1. When large transfer systems in excess of 20x20 ft. in section are not available, grizzly and bulldozing chambers should be situated close up under the ore so that only short finger raises, which must be large, are needed. 2. After the heavy blast, gaseous products of the explosion may be found in the mine in dangerous quantities, particularly in workings in close proximity to the temporarily gas-charged muck pipe. 3. Advice of the powder company representative and his presence on the job at loading time are good insurance for a successful blast.

Conclusions

In conclusion, the authors believe that coyote-drift blasting in glory holes has successfully solved the major winter production problems as well as the year-round problems of producing ore from the steep walls of a glory hole. The fact that the blast, when located on the side of a cliff with normal burden, will break down and out to the cliff face at about minus 45 deg. makes almost all of the broken ore available for gravity drawing. The potentialities of the method are great. Ore could be broken from the walls of a glory hole too far below the surface to be safely mined by other large-scale methods, as the coyote-drift preparation and loading could be carried on with complete safety from underground workings. A few skilled miners and a minimum investment in equipment will produce large tonnages of broken ore. Production difficulties encountered because of the small-size primary crusher could be eliminated and costs reduced materially through installation of a crusher, feeder and haulage equipment capable of handling rock that would pass through a grizzly slot approximately 24 in. in width.

MODERN STOPERS IN ACTION

How to Operate a Stoper

Miners, buzzey school instructors, managers and drill manufacturers have generously contributed this practical advice to teach beginners how to operate stopers safely and efficiently in this sixth of a series of "How To" articles available in reprint form at 15c. per copy. E&MJ expresses its thanks to these men for their cooperation in this service to the mining industry.

A. W. KNOERR
Associate Editor

AFTER WRESTLING WITH A STOPER for a while, a husky miner in a Western camp threw down his machine and bellered, "Why you so-and-so, if you could only stand up and fight." That's exactly the way a lot of green miners feel when they first tackle one of these animals that snorts compressed air, spouts a spray, jumps like a kangaroo, winds the operator up like a boa, and hides a stinger in its tail. But don't let this introduction discourage you, because the "buzzey" can be tamed to do a fast, clean drilling job in stopes and raises if you know how to handle it. Men who *do* know how offer the following suggestions to help you:

First, never try to operate a stoper without being trained by an experienced operator. Most mining companies will see to it that you are trained before you start. Second, bear in mind that stopers are often operated in places where bare rock hangs overhead such as raises, stopes and ore passes, and that the operator often works on a staging. This means that safety must always be your first concern.

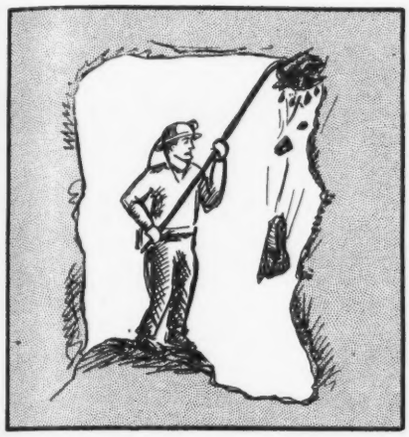
Before you operate a stoper it is also good to know what goes on inside your machine. Then when you push the various levers or buttons you will know why the machine acts as it does and you won't get pushed off your staging, wrapped in the hoses, or speared through your shoe by the stinger simply because you weren't looking in the right place when you pushed the wrong button. So "take five" right now and look over the following pages where stopers are shown inside and out. Study the explanation and look for the various parts that are mentioned.

(We pause here while you read pages 80 and 81.)

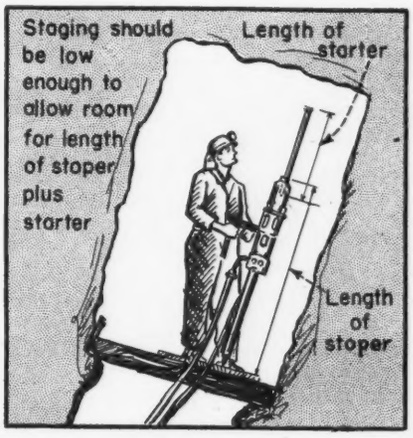
Now that we know how a stoper works, let's climb into a raise and see how an experienced miner would operate one. Assume that the muck has been pulled just enough so that we can bar down and wash the walls and look for bootlegs or misfires. If the working

Stopers shown above (left to right) reproduced through courtesy of the following companies: "200" model, Independent Pneumatic Tool Co.; S-11, Le Roi Co. (Makers of Cleveland Rock Drills); and R-104, Gardner-Denver Co.

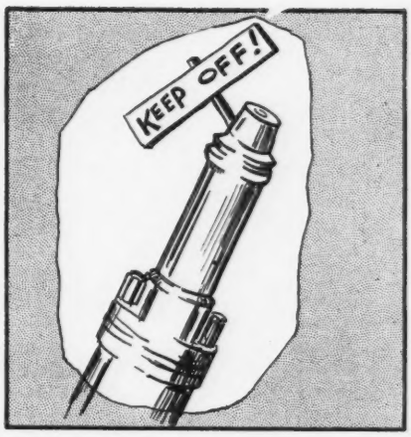
SOME IMPORTANT DO'S AND DON'TS



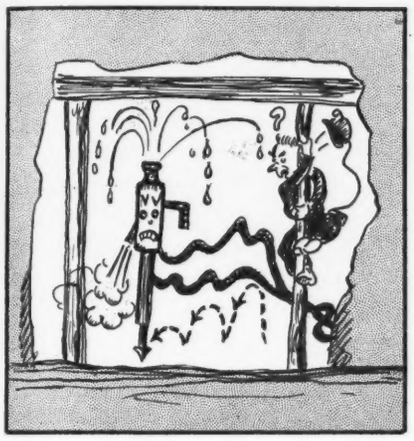
MAKE your working place safe. Bar down. Wash walls. Look for misfires. Stull up.



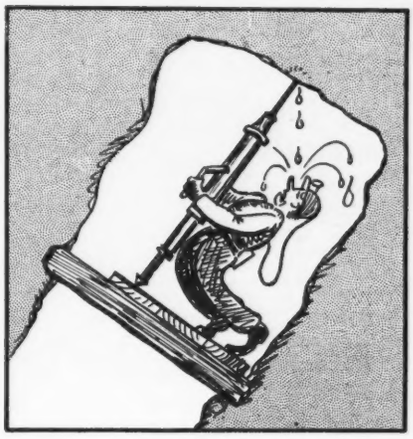
BUILD a stout staging with stulls properly hitched and planks nailed down tight.



ALWAYS keep hands off the chuck so you won't injure them if you shank a steel.



SHUT OFF all of the controls on your machine before you turn on the air and water.



DON'T get under your stoper. Stand over it or to one side, but don't straddle it.

DON'T get wrapped up in your work. Let go of the handle when the stoper twists.

place is safe in this respect, our next job is to build a good staging. This means that we have got to know beforehand exactly what kind of a round we are going to drill so that the lagging of our staging will allow us to place the stinger wherever necessary to drill the various holes for the round. In general the clearance between the back and the footboard (or staging) should be equal to the length of the starter steel, plus the length of the drill, plus the length of the relaxed stinger, or about 7½ ft. (90 in.) for a drill 60 in. long with a 24-in. starter, plus the end of the projecting stinger (relaxed). Having decided where the flooring is to go, we can wedge in some strong stulls, making sure that they are properly hitched on the under side. Next the stulls are covered with enough lagging (2 or 3) to allow safe working room. It is a good idea in slanting raises to run the lagging tight up against the footwall so that the drill and other equipment will not drop through.

Now we're ready to set up the drill. First we connect air and water hoses to the pipelines below. Next we blow out the air hose and flush out the water hose so that rust or grit will not stop our drill. Some drills have air and water screens. If so, make sure that these are not clogged. The line oiler is, of course, coupled in the air hose 10 to 12 ft. from the end nearest the drill. Then we fill the line oiler from our oil bottle, also the oil reservoir in the drill cylinder. This should be done twice a shift. As the outfit we are working for doesn't happen to have any sheepherders on the opposite shift, we note that the miners there have considerately placed plugs of waste in the chuck, and air and water connections of the drill to keep muck out of the machine. These we remove and then connect the hoses to the drill.

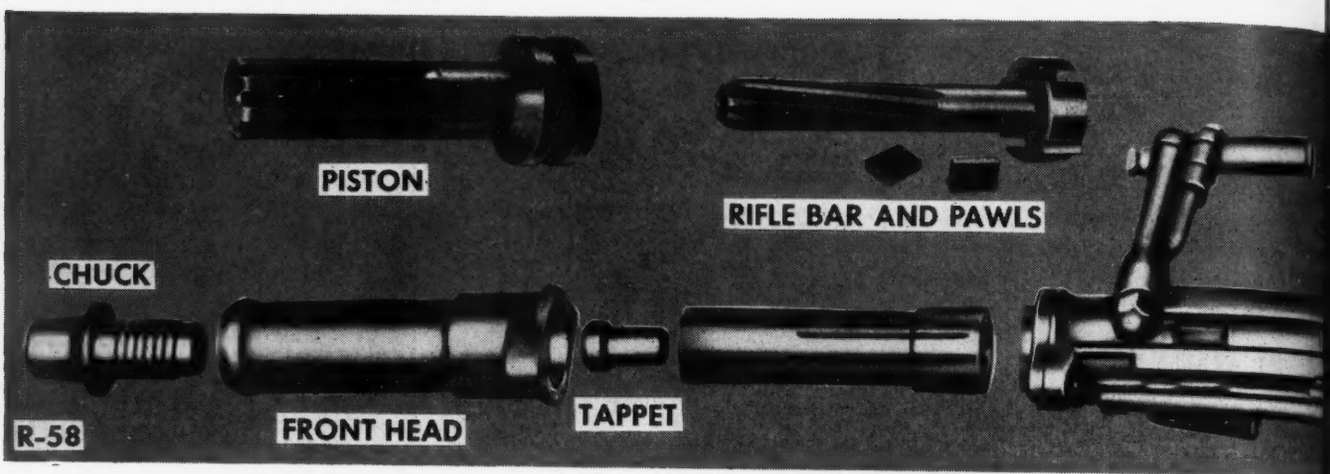
But we are not quite ready to drill yet because we have to double check on the safety situation. We should be wearing leather gloves because rocks have a habit of dropping from the collar of the hole and can cut the hands badly. Also if the steel sticks, the stoper may slam our hand against the rock wall. Because we have to look up most of the time, we should be wearing safety goggles. We must also take time to sound the back. If any slabs are loose but won't budge before the scaling bar, we will have to stull up with either a single stull or with a bridge plus two stulls.

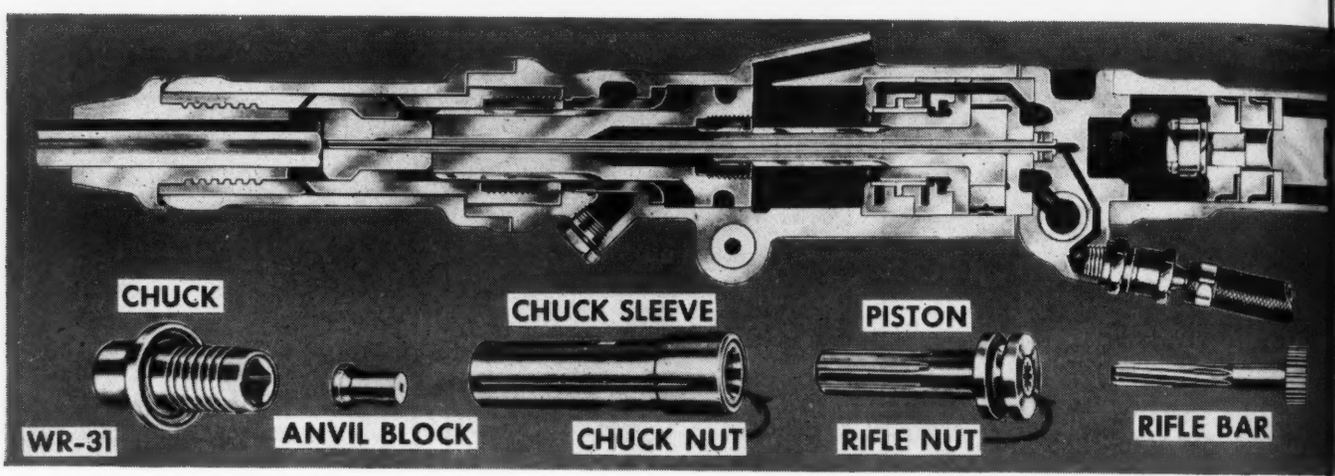
There isn't much room on a raise staging, so we place all tools, oil bottles, picks, scaling bars and bits neatly to one side and arrange the hoses so that they won't get tangled up in our feet. Drill steel should always be stood with the bit end down. Otherwise dirt might cling to the shank end and be forced into the chuck or plug the steel. Shank ends of all steels should be perfectly squared with the sides. If the ends are chipped or crooked, don't use the steel because it will wreck the tappet and chuck.

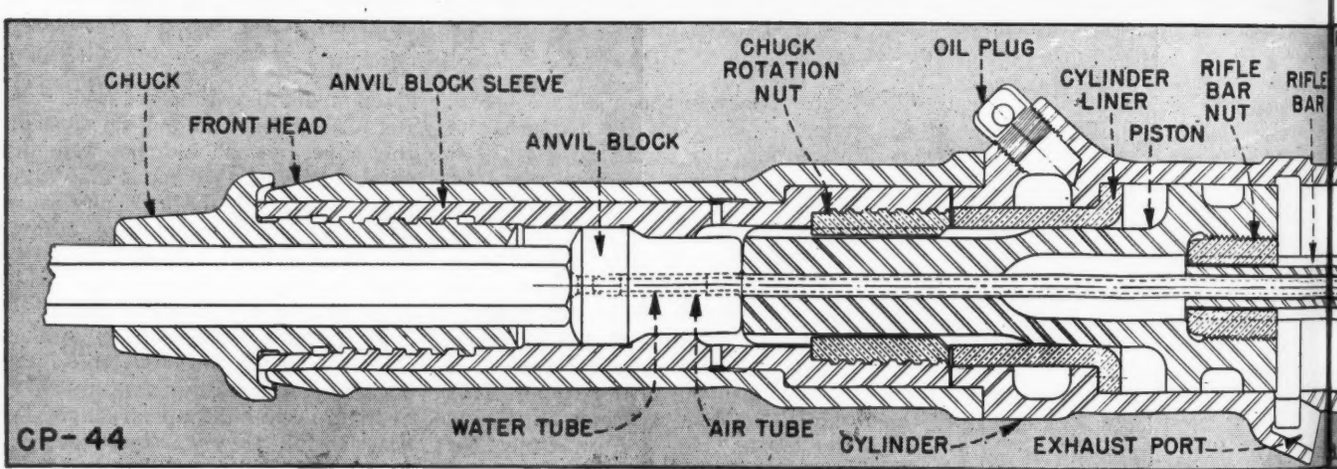
Before opening air and water valves on the pipe lines, *be sure that all controls on the stoper are closed.* If they are not closed, the drill might knock you off the staging when the air is turned on. Also, don't monkey with the con-

(*Continued on Page* 82)

HOW STOPERS ARE BUILT . . .







HOW A STOPER OPERATES

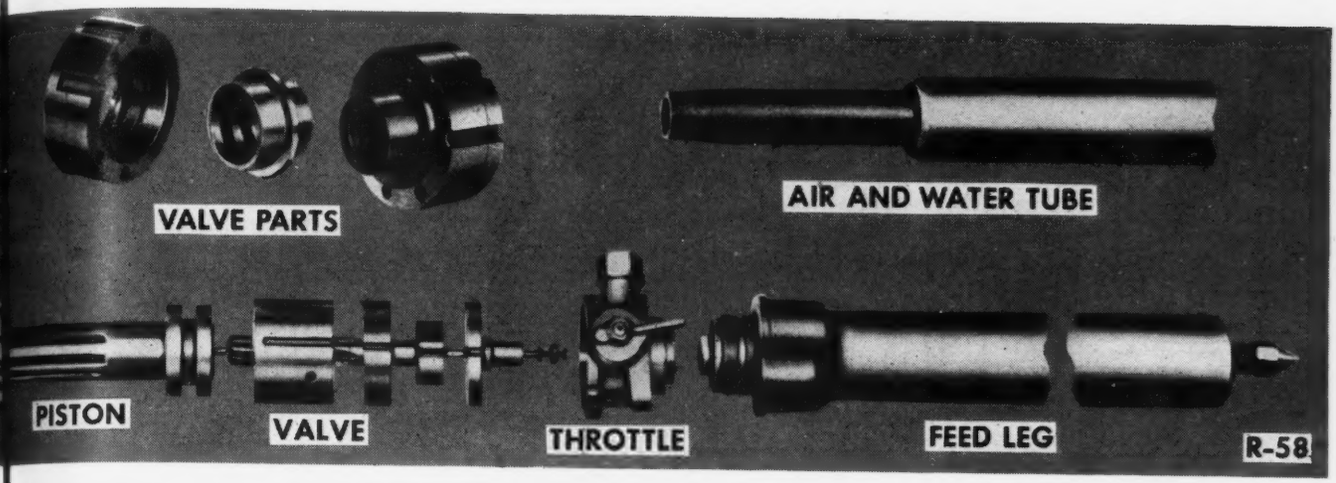
Let's assume that you are ready to drill, and are holding the stoper with your right hand on the rotating handle, and your left hand on the throttle. This is what happens inside of the stoper.

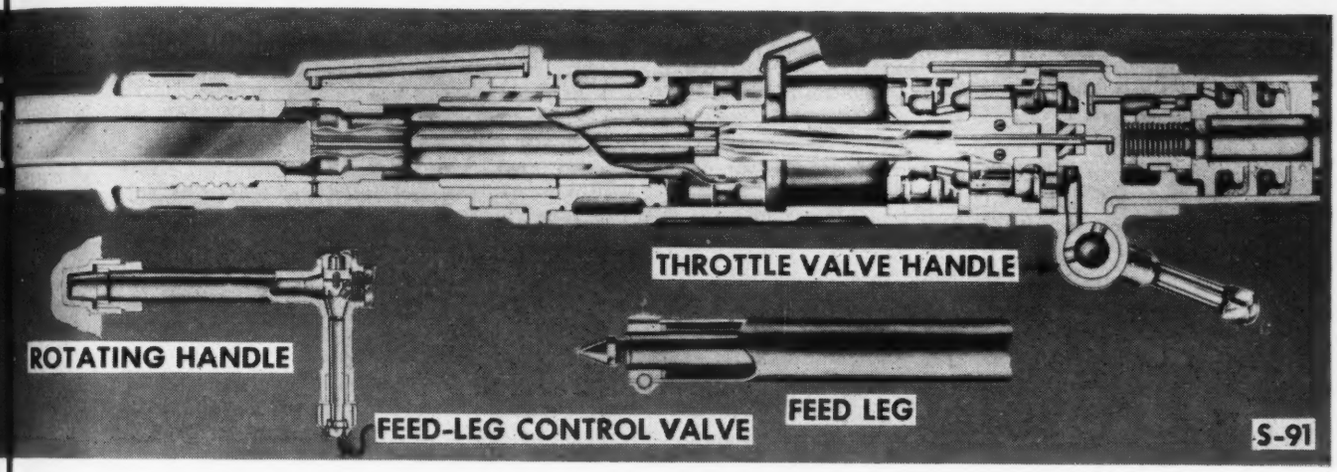
As you open the throttle compressed air enters the backhead of the drill and passes through the valve chest which causes the piston hammer to move back and forth at a speed ranging from zero to 2,000 or more strokes per minute. (Be sure to study the above drawings as you read this.) The piston acts as a hammer driving the anvil block (tappet) which strikes the drill steel in the chuck.

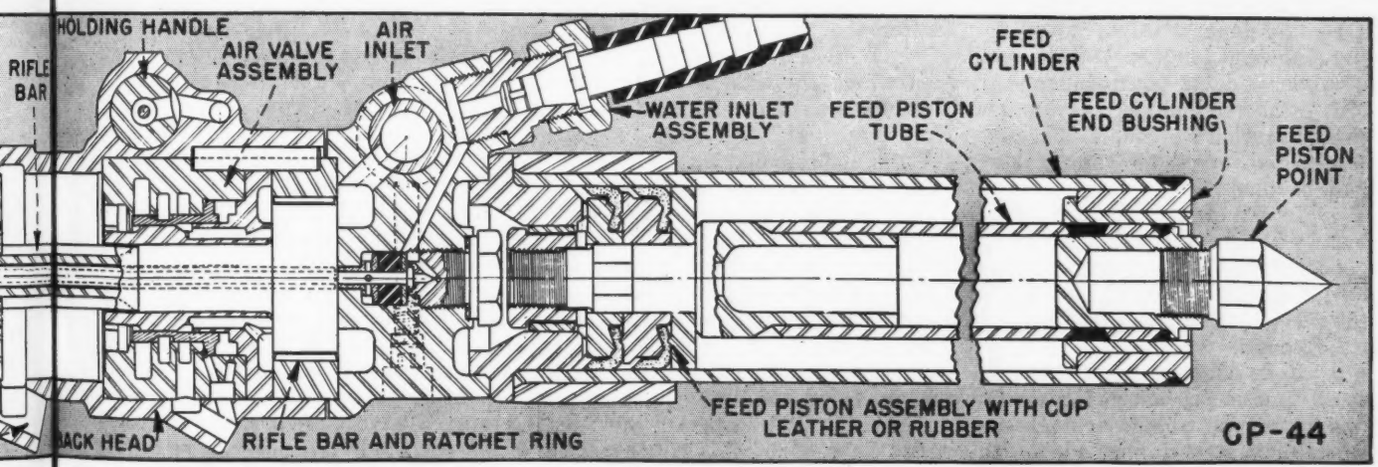
The stoper not only hammers the steel but rotates it also. This twisting action is caused by a series of rotating parts in the following way: As the piston moves back and forth, it slides over a spiral grooved rifle bar. Because the piston is meshed with the rifle bar by a grooved rifle nut, the rifle bar would normally twist back and forth a fraction of a turn without getting anywhere. However, a series of small pawls in the head of the rifle bar engaged teeth in a fixed ratchet ring. This forces the rifle bar to twist a fraction of a turn in one direction only with each complete piston stroke. As the rifle bar rotates it causes the piston to rotate also. Straight flutes on the front end of the piston twist a chuck nut in the chuck sleeve, which in turn rotates the chuck proper and finally the drill steel. Many drills come equipped with a small rotation-release lever or handle grip which allows you to stop rotation.

When you open the throttle valve some of the compressed air goes into the feed-leg cylinder below the backhead. This pushes the piston to which the feed-leg and stinger are attached, and forces the stoper to climb upward or put pressure on the bit during drilling. If you want to ease up on the feed-leg pressure, or let the stoper drop back from the face, merely operate the air-feed

. . . AND HOW THEY WORK







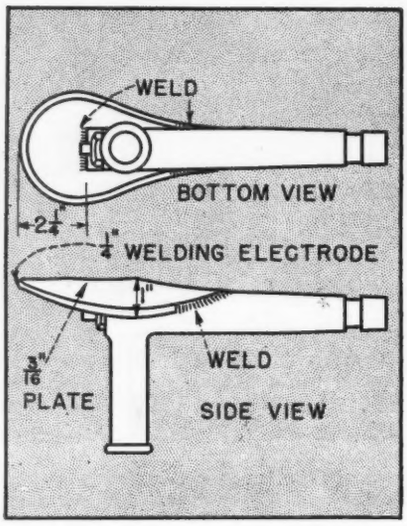
release (or relief) valve in the stoper handle. When you open this valve, some of the air in the feed-leg cylinder escapes. This weakens or stops the pressure on the stinger. Release valves can be controlled from no feed to full feed by means of a trigger, button, or rotating grip in the stoper handle depending upon the make of drill you use.

Water for washing away drill cuttings enters the backhead of the drill and travels through the water needle in the center of the drill to the hole in the drill steel which carries the water to the bit. Around the water needle you will notice an air tube. This carries compressed air from the backhead into the chuck end of the steel, and provides a constant blow which keeps sludge and water out of the front end of the drill. Also notice the oil plug in the cylinder which seals the oil reservoir. This should be filled twice a shift in addition to the line oiler.

As you study these drawings, remember that stoper parts are machined with a watch-maker's precision to tolerances of a few ten-thousandths of an inch. Stopers cost several hundred dollars depending upon size. Although they are designed to deliver sledgehammer blows, they cannot stand being hammered, or abused. Of course the drill manufacturers could armour-plate the machines for the few drill-runners who throw their machines around, but this would add many pounds to the drills and make man-killers of them. Other facts of interest about the above models are: Overall length varies from 59 to 61½ in.; cylinder bore, 2⅞ to 3⅛ in.; steel change, 18 in.; feed cylinder diameter, 2½ to 2¾ in.; feed travel 24½ to 26½ in.; weight 96 to 123 lb. (The 200 stoper on the previous pages weighs 75 lbs.)

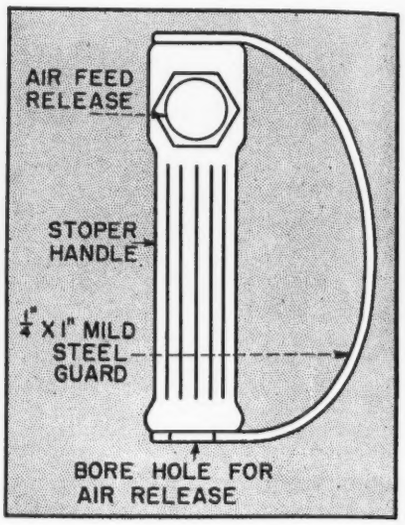
Illustrations for the above models were reproduced through courtesy of the following companies: R-58, Ingersoll-Rand Co.; CP-44, Chicago-Pneumatic Tool Co.; WR-31, Worthington Pump and Machinery Co.; S-91, Joy Manufacturing Co., Sullivan Division.

SOME SAFETY ATTACHMENTS



DRILLERS at Britannia Mining & Smelting Co. insist on having these hand protectors.

CLIMAX provides handles on stopers so drillers will keep hands off the chuck.



STOPER handles at Homestake are equipped with guard to protect miner's hands.

trols when the stoper is lying down. One man in Colorado tried this and was pushed off the staging when the stinger suddenly shot out. Another miner accidentally pushed the throttle while moving the drill over his foot and nailed his foot to the staging. Fortunately the stinger passed between his toes.

Safety Tips

Before collaring the hole here are some general safety tips:

1. Never stand on the downhill or under side of your stoper.
2. Stand to one side of your machine and don't straddle it.
3. Make sure of your footing and balance.
4. In general, hold your stoper by the handle and don't let go. In good ground experienced miners hold the hose and stand back out of the drip, but this is too risky in bad ground.
5. Keep your hands off the chuck at all times. You might loose a few fingers if you shank a steel—i.e., when drill steel jumps out of the chuck and the drill lurches upward.
6. Be certain that all air and water connections are tight. If these break loose, you might get drenched or knocked down.

If by now you have gotten the idea that a stoper is a pretty wicked tool, just remember that so is an automobile in the hands of people who don't think. The hazards pointed out here rarely happen because miners know these things beforehand. You, too, should know these things in advance, also that stopers can be handled to drill out a round fast, easily and safely as the following paragraphs will show.

Experts tell us that before collaring a hole you must know exactly where each hole is to be spotted and how it is to point. If possible, try to pick a slight depression in the face so that the bit will not bounce off. Otherwise, make a depression with a pick or scaling bar, or by throttling the machine so that the bit will chip out a pocket. The drill should be lined up at right angles to the face, regardless of what angle it may be to the staging. Then after the hole has been collared it is easy to bring the drill to the line on which the hole is to be drilled, and be sure that the *drill stays on that line until the hole is finished.* The steps in collaring a hole are as follows: Place the right sized bit on the starter steel. For example, if it takes three changes to drill a hole, choose the smallest gage bit in your rack which will permit you to use two still smaller bits for the second and third steels. Raise your machine so that it is at right angles to the face, standing over it but not straddling it. Turn on the water part way, but wait until quittin' time for your shower. Place one hand on the throttle with the other on release button. Then press the release button slightly and open the throttle just enough to raise the bit to where the hole is to be collared. Finally, open the throttle to start rotation as the bit strikes the face. One Homestake miner says collaring a hole is just like jabbing your fist into an object and giving it a twist as you hit it. But, he cautions, don't try to bring the jab up from the mat and try to make a haymaker out of it. Climax miners get good results by bouncing the buzzey slightly so that the bit will chip off a footing for the hole. In fact, a smart operator will pick spots for four or five holes in advance and hammer off footings so that it will be easier to collar other holes.

Once a hole has been collared, you can go merrily ahead at full throttle, but if you hit soft or ravelly ground, go easy, use only half head of air on the release button and cut down the throttle, but not enough to stop rotation. If possible, work the steel up and down in the hole with the release button. Use as much water as possible in soft ground. In broken ground, use enough water to produce a runny mud so that the mud will have a tendency to seal off broken ground, but not block the hole. Go easy also when you drill into a slip or seam. One side of the seam may be hard and the other soft. This will cause the steel to veer off into the soft ground and stop rotation.

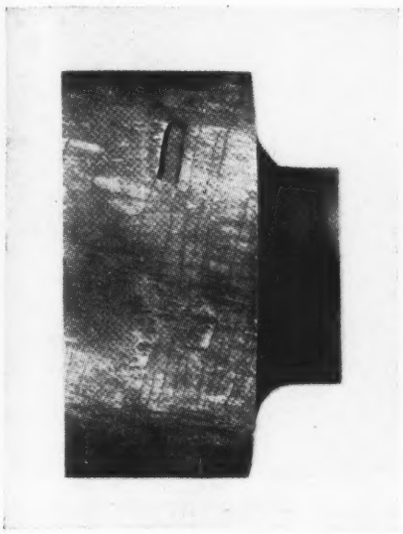
This brings us to the subject of stuck steels which Dante forgot to mention in his Inferno, but which miners have cussed into perpetual infamy. What causes these stuck steels that make a "Terrible Tempered Mr. Bangs" out of a normally calm drill runner?

Here are some of the answers:

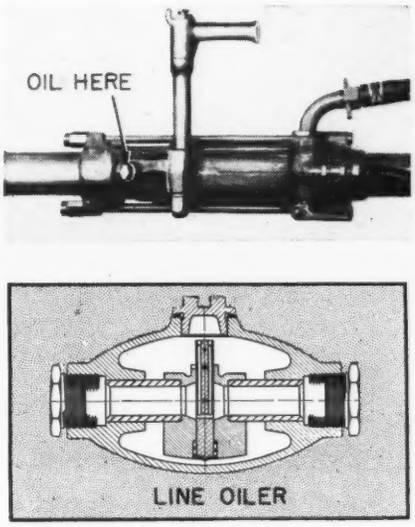
1. Failure to use enough water.
2. Slips or mud seams.
3. Stoper getting out of line.
4. Bits with wrong gage, or badly worn reamers or cutting edges.
5. Plugged bits or steel.
6. Not using the relief button to get free rotation.
7. Running steel into a partially drilled hole with air wide open.

In general, then, stuck steels can be prevented by seeing to it that water keeps running out of the drill

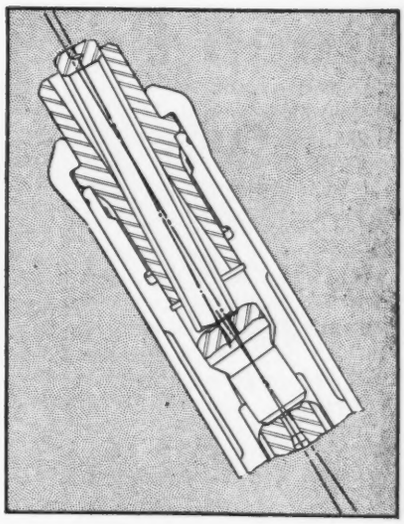
KEEPING YOUR MACHINE FIT



DRILL parts like this piston burn up in a hurry if the machine runs out of oil.



TO PROTECT your machine fill the oil bottle and oil reservoir about twice a shift.



THIS HAPPENS to drill parts when shank ends are broken or chuck bushings are worn.

hole (not out of the chuck), that your drill is always in alignment, and by slowing down when it shows signs of stopping rotation.

If you are running at full throttle when the steel sticks, the powerful rotating device in the drill will start to twist you around instead. Something has got to give. When this happens, let go of the handle, stand back, and shut off the air. This is better than getting wrapped up in the buzzey.

If a steel gets stuck, sometimes you can remove it out by turning it with a wrench and pulling at the same time or by getting plenty of water to the bottom of the hole. But it is often faster to drill a new hole alongside of the lost hole.

After the starter has been run out, use care in backing out of the hole. Operate the controls so that the steel will stay in the chuck as it comes out of the hole. Otherwise it may drop on your head. Some drills are designed so that the chuck retains a sort of pneumatic grip on the shanks. This enables a driller to back the drill out of a hole partially filled with talc or mud. When changing steels, be sure to select one with a properly gaged bit, and check steels to see that they are not plugged. Some miners use a soft hammer to knock off bits, hammering the joint between the bit and the rod, rather than the bit wings. Other miners hit the steel against the rib at a point below the bit. This causes vibrations which loosen the bit. For real drilling speed, new bits should be attached to steel changes well ahead of the time the changes are needed. Some top-notch miners drill two holes from the same set-up collaring first one, then the other, and alternating on successive changes of steel after that. One Climax shifter actually handled two stopers at the same time just to demonstrate that a round could be drilled that way. But this is post-graduate work and not recommended for beginners.

Right here is a good place to tell you how to take care of your machine. Ordinarily stopers run smoothly, but if they run out of oil, the close fitting parts inside will burn to blue hardness in a short time. Therefore, if your drill starts to heat up or gets sluggish, stop it at once and check the line oiler and the oil reservoir in the drill. Better yet, don't wait for the drill to act up, but keep your eye on the chuck and shanks of the drill steel. Oil slicks in these places are signs that the drill is properly lubricated. Also watch the exhaust which should feel oily or stick to the hand.

Here are a few other points to note: Check the side rods and see that they remain tight. Otherwise the stoper will start to come apart at the seams and damage the internal parts seriously. The water needle should also be checked. If it breaks or leaks, water will jet against certain internal parts and prevent lubrication. A faulty water needle will also cause stuck steels. Some stopers are built so that water needles can be replaced in the mine, but others should be sent to the repair shop. One final word of advice: Just because a buzzey sometimes appears to act like a vicious animal, don't beat it with a steel or hammer, or drop it down the raise or into the muck pile, or bar down rocks on it. These precision built tools are made to save effort, and only an old-timer who pounded away with a single jack can really appreciate how much hard work a stoper saves.

After you have drilled out your round, shut off the air and water, disconnect the hoses, coil them neatly, and hang them where flyrock from the blast won't reach them. Pour a little oil into the chuck and then plug the chuck and air and water connections with waste. Finally, lower (don't drop) your drill to some safe place for the opposite shift to use.

To sum up this article, we might add this comment. We asked a drill expert in Idaho, "What part of the stoper gets out of repair most often?"

"The operator!" he replied.

Undoubtedly most troubles with stopers occur because the operator doesn't operate right, so here's hoping that this article will keep that part in good repair.

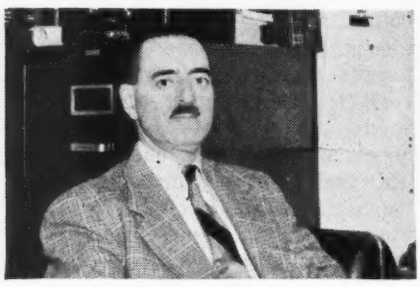
E&MJ wishes to thank the following for their assistance in the preparation of this paper: The operating staffs of the Climax Molybdenum Co., Climax, Colo.; the Howe Sound Co., Chelan Division, Holden, Wash.; Homestake Mining Co., Lead, S. D.; Anaconda Copper Mining Co., Butte, Mont.; Britannia Mining & Smelting Co., Ltd., Britannia Beach, B. C., Canada; and staff members of the following equipment manufacturers: Ingersoll-Rand Co., Gardner-Denver Co., Chicago-Pneumatic Tool Co., Worthington Pump & Machinery Co., Independent Pneumatic Tool Co., Joy Manufacturing Co. (Sullivan Division), and the Le Roi Co. (maker of Cleveland rock drills).

Steep Rock Today

Enterprise in Canadian Iron Country north of Lake Superior looks ahead to bigger output

LOADING ROCK broken from footwall on 1,140 bench at Steep Rock early this season. Equipment seen includes 4-cu.yd. electric shovel, 15-ton and 22-ton trucks, and churndrills.

M. S. FOTHERINGHAM



NEIL EDMONSTONE

RAILROAD LOADING BINS at Steep Rock. Conveyor delivers ore from crushing plant.

OPEN-CUT MINING OPERATIONS in the former bed of Steep Rock Lake in western Ontario have already yielded Steep Rock Iron Mines, Ltd. over 2,560,000 tons of high-grade iron ore, low in silica and phosphorus, up to the start of the 1948 shipping season. Waste stripped, to get at the ore, approximates 11,828,000 cu.yd., including 3,067,000 cu.yd. of rock, the rest being silt. Water pumped has totaled 168,880,000,000 gal., more than two-thirds of these billions of gallons having come out of the lake. The balance has been recirculated. Ore to be won in the not-too-distant future is indicated by the reserves shown by drilling. An estimate made by the company as of May 1, 1947, puts these at approximately 21½ million tons of proven ore and over 51 million tons of probable ore, this under the unwatered portion of the lake. In addition there is the possibility of other deposits beneath the remaining waters of the lake and in adjacent areas, as suggested by the results of geophysical work.

M. S. Fotheringham is Steep Rock's vice president and general manager, Sydney G. Hancock is mine superintendent, and K. L. McCrorie mine engineer. Neil Edmonstone is secretary-treasurer.

The Diversion Scheme

Five years ago the Steep Rock company was nearing the finish of the spectacular project it had undertaken of diverting the water entering Steep Rock Lake and unwatering the lake's middle arm to mine the hematite ore that lay beneath. How this herculean task was done, in the region of lakes and woods north of Lake Superior, was told in E. & M. J., Dec., 1943.

Drilling under the middle arm had revealed two ore zones, the "A" zone at the north end and the "B" zone at the south. Of the tonnage of reserves already given, the latter zone is estimated to contain 14,162,000 tons of proven ore and 4,781,000 tons of probable ore. All production has come from the "B" zone. Last year the million mark was passed with an output of 1,206,000 tons. Under the present season's program, approximately the same tonnage will be shipped. At the same time, it is planned to remove 1,750,000 cu.yd. of waste in 1948. The stripping ratio indicated is abnormal and will not continue.

Since surface mining began on the "B" zone in 1944, using power shovels and trucks, a pit has been opened along 2,000 ft. of the zone's present known length of 4,500 ft., skirting the former shore line on the orebody's footwall side. In width, the almost vertical deposit has varied from 95 to 425 ft., averaging 125 ft. The footwall, of ferro-dolomite, rises steeply above the pit and has had to be cut back as the pit deepened, this accounting for a large part of the rock broken

ON THE 990 BENCH, one of four benches that have been opened on the hanging-wall side of the Steep Rock pit.

SCREENED LUMP ORE ready for shipment.

in stripping and the heavy stripping ratio. The contact between this footwall and the ore revealed on removal of the silt and clay in the unwatered lake bed, stood at an average elevation of about 1,128 ft. The corresponding hanging-wall contact, which was further out under the lake before unwatering, had an elevation of 1,050 ft. on the average. The original lake level was at 1,263 ft. elevation.

Today, the open pit from which all production has come, shows 11 benches in waste on the footwall side, at 30 ft. vertical intervals down to the present bottom at 960 ft. On the hanging-wall side there are four 30-ft. benches, the uppermost having an elevation of 1,050 ft. Width of bench, or berm, varies. Benches are driven flat. Slope of the banks is a little over 45 deg.

According to the management, the present pit will provide ore for eight to ten years. Before it is worked out, underground mining should have begun, increasing in scale as open-pit work declines. Possible underground methods are being considered.

Currently, production has been coming from an extension of the pit to the southeast, stripping of which began during the past winter. In the older portion northwest, mining has been marking time while waste broken from the footwall was being loaded out.

Mining equipment comprises two P&H 1,400 4-cu.yd. electric shovels, one having been recently delivered; also three 2½-cu.yd. Northwest diesel shovels. In addition there is a Northwest shovel-crane-dragline.

Transport is provided by 34 Euclid rear-dump trucks, 22 of 15-ton and 12 of 22-ton capacity. The larger size is gradually being substituted. For general pit use there are five D-8 tractor-bulldozers and one D-7. For drilling there are five 29-T Bucyrus-Erie churn drills and six of Keystone make.

Plans are in progress to substitute a belt-conveyor system for the present long truck haul between pit and railroad bins. As planned, this will have an overall length of 3,146 ft., a total lift of 400 ft., and consist of three flights of 30-in. belt. The longest single flight will be 1,344 ft. and the others 1,182 ft. and 620 ft., respectively. A fourth flight may eventually be added. Capacity will be 700 long tons per hour. One 200-hp. motor and two 150-hp. motors will drive the respective belts. Once this is installed the trucks will stay in the pit, except while stripping. This change will necessitate moving the crushing plant and 48x60-in. crusher at present near the bins into the pit.

A large amount of churn and diamond drilling and geophysical surveying has been carried out on the "A" zone. No other work has been done on this zone save for the shaft that was sunk originally to prove ore at depth. This shaft will doubtless prove useful for draining surface workings and in subsequent underground operation. The zone is further away from the overhanging shore line in a flat area and is considerably wider than the "B" orebody. In consequence a smaller stripping ratio is anticipated. Drilling is in progress on the "A" zone. The estimate of reserves as of May 1 last year, already published, gives it over 7,000,000 tons of proven ore and 46,354,000 tons of probable ore.

Owing to limited exploration, little is known about the ore supposed to lie beneath the eastern part of the lake and in the area to the southeast. Water is still deep in the Falls Bay area, but its level is being progressively reduced. The amount of water currently pumped, including that from other parts of the property, totals 2½ billion gallons monthly.

An increase in output is desirable—to speed the reduction of Steep Rock's present indebtedness. Obviously this can be obtained most easily by developing the "A" zone for production. Of this, talk has been heard in recent months, which is expected to result in action.

Despite the completion of the diversion scheme, the Steep Rock enterprise is still spectacular. The engineering achievement, so unusual for a mining company, whereby the waters that would otherwise enter the lake are turned aside and disposed of, has made available a large tonnage of high-grade ore that without it would be unavailable. The *entrepreneurs* are to be admired for their courage.

MINERS WANT a house like this when they settle in a new camp, and their earnings are usually high enough to entitle them to it.

Houses for Miners

Two Companies Build Them to Cure Manpower Shortage

THE BUNKER HILL AND SUNSHINE companies in the Coeur d'Alene district, Idaho, have both decided that the shortage of livable houses is the most immediate cause of the manpower shortage that is holding back their production, and they have decided to do something about it. Both are now building houses and both are finding the job easier and less troublesome than they thought it could be.

Why Build Homes?

The pictures on these pages state the problem. Most metal mines need underground miners. Estimates run as high as 5,000 underground jobs open, yet very little interest is shown in them by job applicants.

You hear all sorts of reasons for this miner shortage. Mines too hot, work too tough, surface work easy to get at good pay, migration from mines during the war, and so on. Good reasons, all of them.

But suppose an ex-miner does decide to go back to the mines. He drives up to a mining town he used to know. At once he finds he can get a job, but he can't find a house for love or money. That's what really sends him away. He might take heat and bad air and heavy ground, but he won't take having to make his family live in a dog kennel. At least, the good miners won't because they don't have to stick to mining to make a living.

Those two pictures were taken in a Western mining town, but they could have been taken in almost any metal mining camp. This combined shortage of underground miners and houses is true of nearly every mining district in the country. Some communities like Butte, Mont., have been able to provide almost enough houses to go around, but most have not. To illustrate the problem and one solution of it, we might single out Kellogg, Idaho, and tell what happened there.

Accurate estimates are hard to make, but it is safe to say that Bunker Hill's production of lead-zinc ore at its mine in Kellogg, Idaho, is off about 50% because of a lack of underground miners.

At the Sunshine mine, east of Kellogg on Big Creek, mine output is about two-thirds what it could be if the mine had a full crew.

Both companies have come to the conclusion that housing is the answer. For a sample of the local situation on which this conclusion was based, the best place to go is the office of Mr. James V. Patano, director of a veterans' housing project in Kellogg.

On the Waiting Lists

Mr. Patano is a capable young fellow, normally quite cheerful, but he is now in some danger of succumbing to deep pessimism. He runs a development of 96 apartments of from one to three rooms, for veterans only, and without restriction as to their place or manner of employment. They are completely furnished, except for utilities, and rent for $21.50 to $31 a month. Each week about 60 or 70 new names go on Patano's waiting lists, and in an average month less than five vacanies occur.

People, desperate for a decent place to live, keep coming back to

MINERS GET nothing better than this in most strange camps, so they keep moving. Note attempts made to brighten up this house.

Patano to ask how they stand. He can see the disbelief, and often hatred, in their eyes when he tells them they are still sixth, or nineteenth, or sixty-seventh on the waiting list, as the case may be. When we talked with him early in June, he had just moved a family into a two-bedroom apartment for which they had been waiting since October 5, 1947.

Then when an ex-GI miner does hit the jackpot at last, his relatives come and move in with him. It is not uncommon, Patano says, to find 15 people, perhaps 8 or 9 of them children, living in a two-bedroom apartment. The result is that Patano has to ride herd on 143 children (as of June 4, 1948). The small fry are continually inventing new ways of injuring or violently erasing themselves, and the constant vigilance needed to circumvent them is telling on Patano's nerves.

Miners make up 85% of the wage-earners in the project, and they come from most of the mines in the district. So if you're a veteran with a family and want a small apartment in Kellogg and can wait 8 or 10 months, you can get one from Mr. Patano.

This situation is not only unhealthy for a town the size of Kellogg, it is bad for the companies mining there. Bunker Hill & Sullivan Mining and Concentrating Co., as the largest operator, felt called upon to do something about it. The company's objective was two-fold; first, naturally, to get more and better miners to work for Bunker Hill; second, to make Kellogg a better place to live. This latter objective has always been in the forefront of Bunker Hill's planning since Stanley Easton built the first houses in Kellogg 40 years ago. Bunker Hill is, in fact, a pioneer in the construction and sale of homes for the benefit of its personnel.

Bunker Hill Builds

Both the foregoing objectives could be met by building good low-cost houses, a lot of them. Therefore, Bunker Hill set about finding the best way to do it. The company's engineers made a survey of housing projects all over the Northwest. They got ideas everywhere they could on how best to build good houses economically. They put them all together in a picture of what they wanted for Kellogg and then invited private contractors to give them estimates of costs for such houses.

All the contractors, large and small, nearby and remote, were alike in one respect. They had to figure on a selling price sufficiently high to cover not only a substantial profit for themselves, but journeyman union labor and living costs while in Kellogg, and transportation, materials and supply costs.

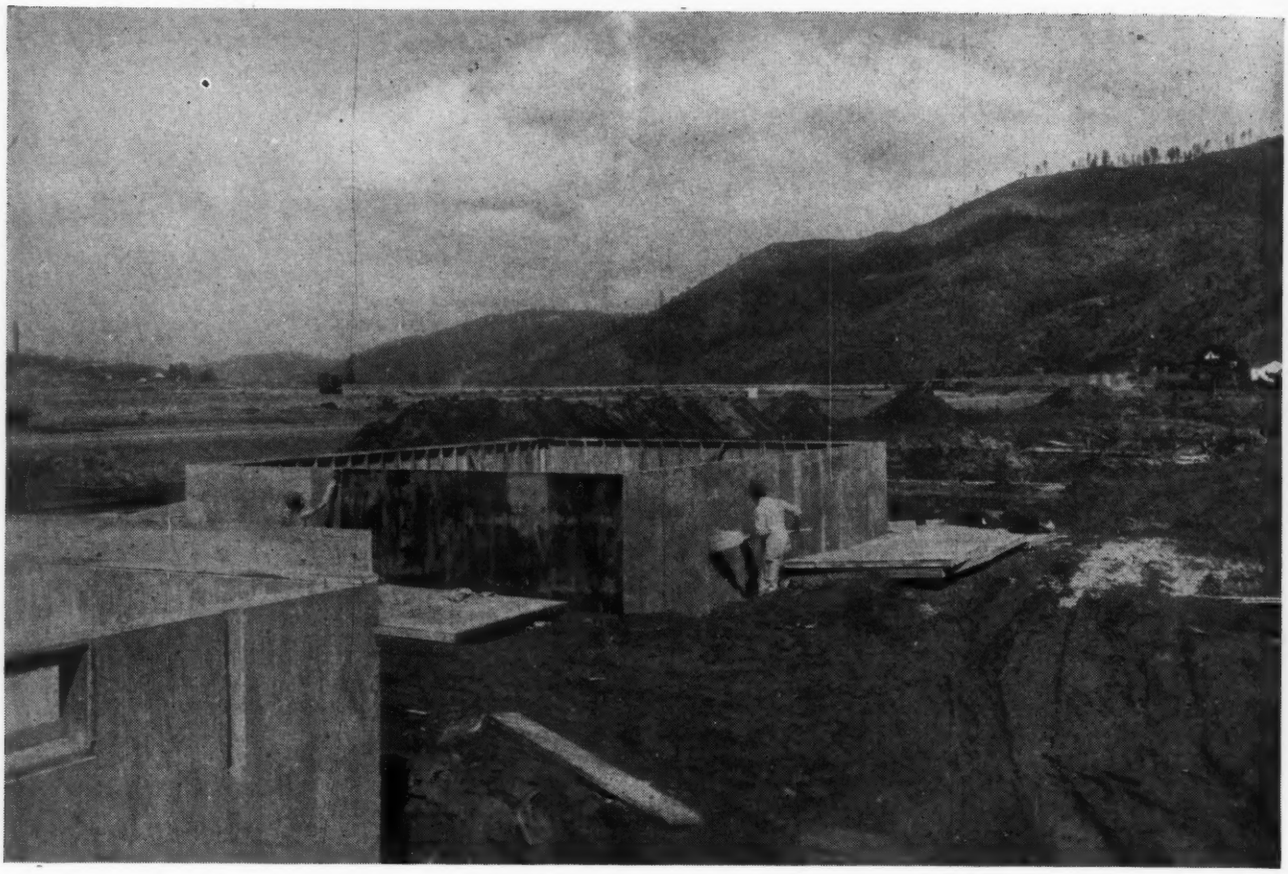
Bunker Hill felt that this wouldn't work out satisfactorily. The people who bought these houses were to be Bunker Hill employees, and the company hoped they would want to continue as such. The company did not want to, and it felt its employees should not have to, pay too high a price for its houses.

Bunker Hill, therefore, decided to build the houses and sell them to its employees at cost, which was to be held as low as possible and still build a good house. Furthermore, the company decided to build four buildings of 10 apartments each. These will be one-bedroom apartments with oil stove and oil heater. They will cost about $3,500 per apartment to build, and they will be rented for $25 per month, only to underground miners working for Bunker Hill. They will be ready by September.

One thing to note, in building both houses and apartments, the company is charging no overhead items to the cost of the house. All clerical work, for example, is done by the company's regular employees, and no charge is made.

After Bunker Hill's engineering staff had drawn up the plans, they

Bunker's Hill Houses Are Built in Kellogg



FAST CONSTRUCTION is part of Bunker Hill's plans. Concrete foundations are poured into pre-built forms, easily detached and moved to next unit. Houses have full basements, will use coal furnaces. Site will be graded up to give sewer drainage.

VARIETY in outside appearance will characterize B.H.&S. houses. On 60x80-ft. lots, with insulation, hardwood floors, garage, employees will buy them for about $6,500.

cast about for the equipment to build the houses quickly and cheaply. The company could buy lumber, cement, electrical fixtures, pipe, and so on, in wholesale quantities and at wholesale prices. It developed also that a fair-sized mining company has on hand a lot of equipment that is useful in building houses.

For example, the company regularly employs carpenters, electricians and plumbers who could be shifted to the housing job. The company had its own pre-mix concrete plant for building foundations, its own shovel, bulldozer and trucks for digging cellars, and its own timber-framing tools. One of the most useful pieces of equipment is a Ross loader of the fork truck variety.

Forty-eight houses will be built this year on a site at the foot of the hill straight across the creek from the Bunker Hill mill. This project will form a new addition to the city of Kellogg, complete with sewage disposal system, water, electricity, sidewalks, curbs, lawns and surfaced streets. Bunker Hill has already begun to plan more projects as large or larger than this present one.

Sunshines's Houses Look Up Big Creek

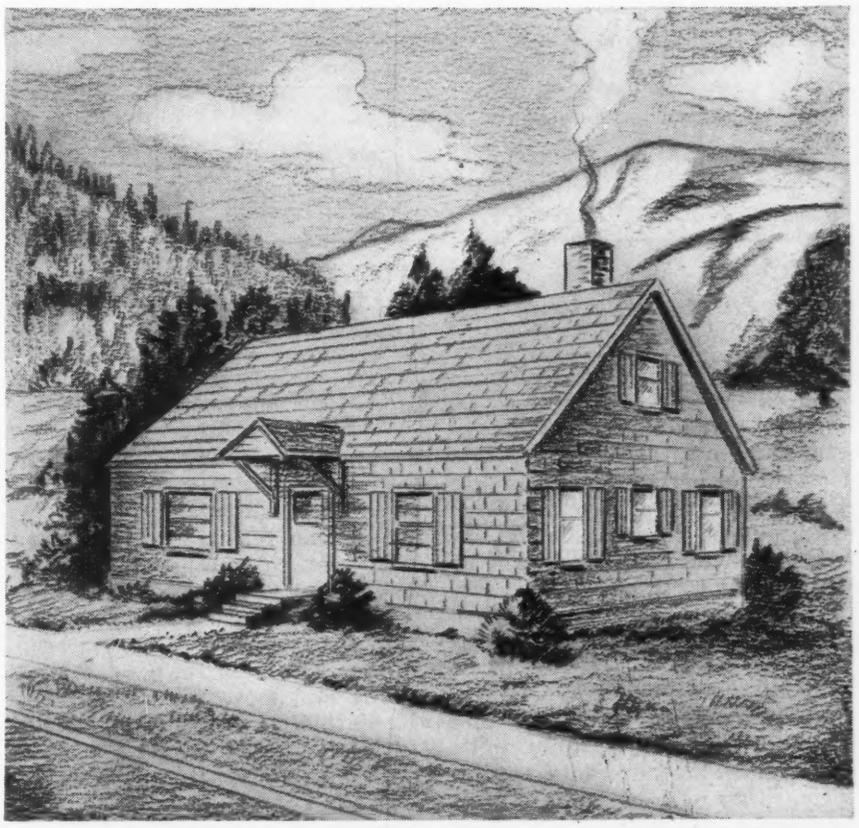
BEAUTIFUL SITE was chosen for Sunshine's houses next to golf course near mine. Footings go in here for first of ten houses to be rented only to underground miners working for Sunshine. Houses have no basements, will use oil-fired floor furnaces.

These houses will be sold to Bunker Hill employees on FHA terms through local banks. That is, the company approves the applicant for a house and he gets a loan from the bank, secured by an FHA mortgage. The bank gives Bunker Hill the amount of the loan and the company is through with the deal. The employee has his home at a very low cost, and the company has no further responsibility in maintaining the house. Prices of these houses is expected to be somewhere around $6,500.

There have already been 90 applicants for the 48 homes to be built in Kellogg this year, all of them Bunker Hill employees. More come in daily. You have to work for B. H. & S., not necessarily underground, to get one of these houses, but the company has no control over what you do after you buy it. The company does have an option to repurchase the home if you later wish to sell.

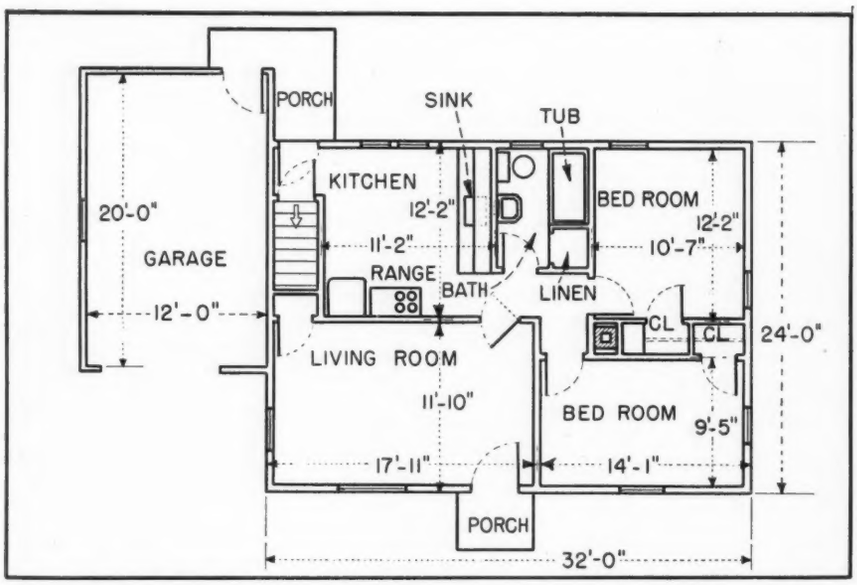
Sunshine's Houses

Sunshine Mining Co.'s need of underground miners is rather more urgent than Bunker Hill's, and, for a medium-sized mining operation,



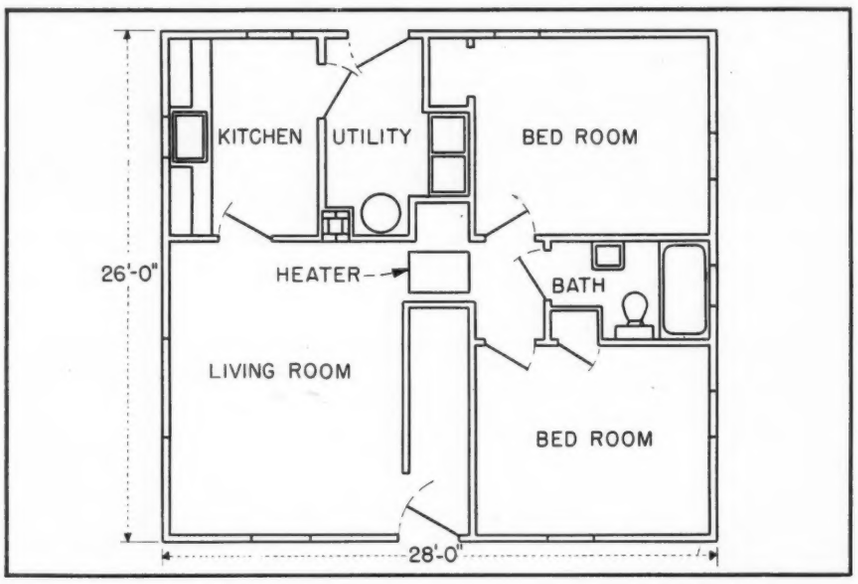
RENTED unfurnished, Sunshine's four-room houses have space for two more rooms in attic. They have electric hot water heaters, electric stoves, separate garages. Lots are 50x75 ft.

Mining Engineers Can Also Plan Good Houses.



ONE OF TWO floor plans for Bunker Hill's houses. All units have 720 sq.ft. of floor space; some have attic space. Oswald R. Walch, B.H.&S. engineer, drew plans.

PROJECT for B. H. & S. is directed by I. A. Robson (right) and C. W. Simmons (left).



SIMPLE but effective floor plan for Sunshine's houses was drawn by John Magura, of engineering office. Walls are 3-ply; floors are 5-ply Plywood covered with linoleum.

SUNSHINE'S project is supervised by John Edgar, the company's superintendent.

Sunshine's housing program is quite extensive.

The company has chosen an absolutely beautiful site for its houses down near the mouth of Big Creek next to the golf course. Work has begun on 10 houses to be finished this year, and more will be built next year if conditions warrant.

These will be four-room houses (see floor plan) and they will be built on 50x75-ft. lots. There will be two bedrooms downstairs and space for two more upstairs, to be built in as the occupants require them. They will be built without basements, and will be heated by oil-fired floor furnaces. Garages will be included.

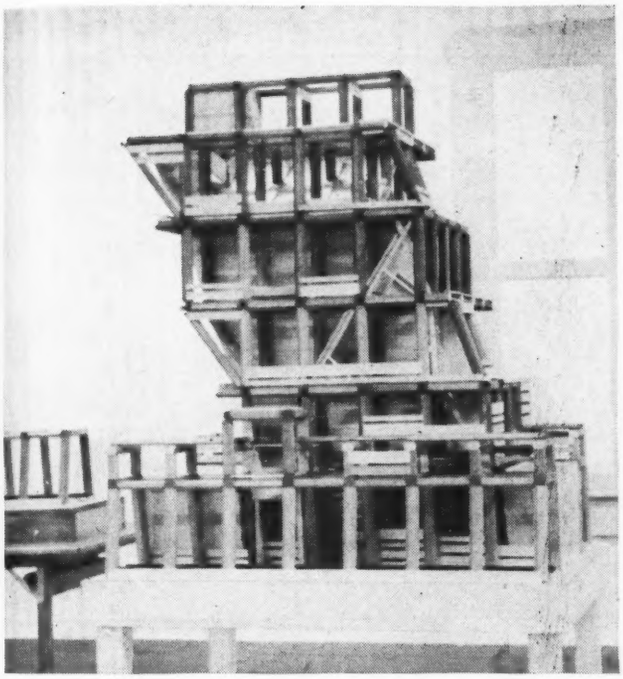
Sunshine's houses will be rented to underground employees only. Supervisors are excluded. James Shreve, office manager, will handle the project, once renting of the units gets under way.

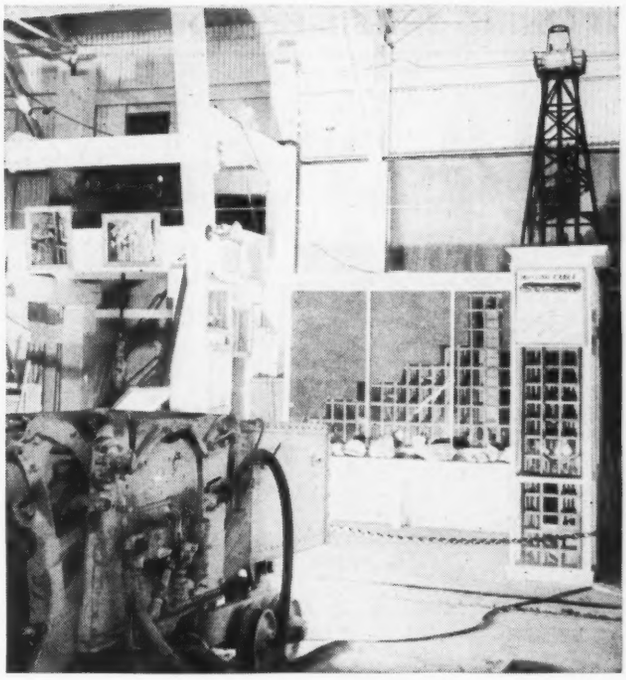
Sunshine found, as did Bunker Hill, that contracting the houses would cost too much. The company's engineers drew up the plans and the company's regular employees will build them.

The first move was to set up a 40x80-ft. Quonset "hut" at the site to receive supplies and act as a timber-framing center. They use a DeWalt framer from the mine. Sunshine need pour only footings, therefore a pre-mix plant like Bunker Hill's isn't necessary. All lumber will be cut to size in the Quonset, and other construction short-cuts will be taken wherever possible. Sunshine reports, as did Bunker Hill, that building houses is a lot easier than it looks if you can build several at a time and give ingenuity free play.

Will It Work?

As we have said, Bunker Hill and Sunshine are building these houses primarily to get more underground miners. If they do get them, a way is clearly pointed to at least local relief of the shortage of miners that plagues so many metal mining camps in both the East and the West.





MINING EQUIPMENT and accurate scale models of square-sets are displayed in the Mining and Safety Exhibit to train employees.

How Anaconda Trains Employees To Work Safely and Efficiently

LESTER F. BISHOP*
Production Foreman
Engineering and Research Dept.
Anaconda Copper Mining Co.
Butte, Montana

MORE PRODUCTION PER MAN or per unit can be achieved by careful recruitment, increased mechanization, improved methods that make the best use of manpower, and conservation of manpower through safety. However, emphasis must be placed on job training to make all these factors really effective.

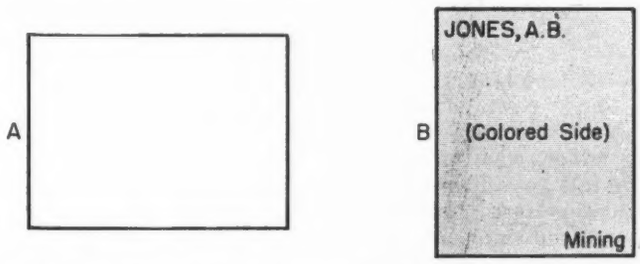
Although it has long been recognized that good supervision is necessary to "get things done," this requirement should be expanded to include training that will stimulate quality work performed safely, on time, and in the required amount. Thus supervision could be improved by improved training; training can be improved by identifying it, analyzing it, and eliminating its weak points.

*Adapted from a paper presented to American Mining Congress at El Paso, Texas, in October, 1947.

(Continued on next page)

Object Lesson: The Value of Job Training

Suppose you were given blank card (A) with one side colored, and the other white, and asked to jot down your name and the name of your industry.



What would your chances be of filling it out exactly as shown at (B) without specific instructions?

The answer is 1 in 800.

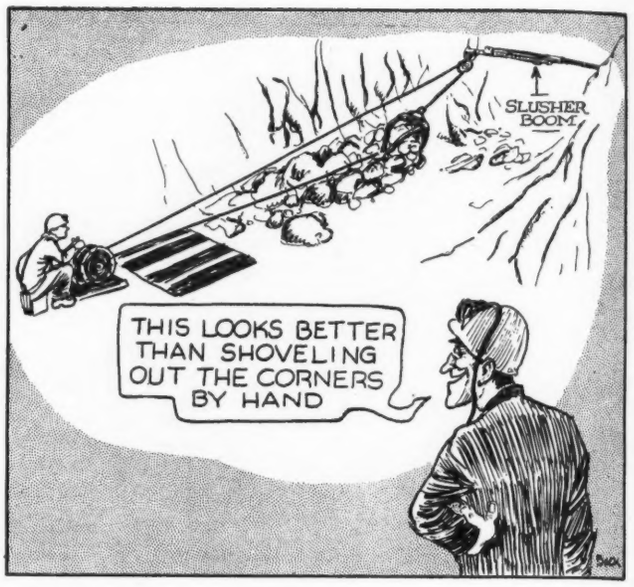
Here is how this is determined:

Your chances of selecting the colored side are 1 in 2; of orienting the card with long axis vertical, 1 in 2; of writing your name in the upper left, 1 in 5 (There are roughly 5 areas, four corners and the center); of lettering your name instead of writing it, 1 in 2; of writing your last name first instead of last, 1 in 2; of writing the name of your industry in the lower right, 1 in 5; of lettering it instead of writing it, 1 in 2.

Hence the result: $\frac{1}{2} \times \frac{1}{2} \times 1/5 \times \frac{1}{2} \times \frac{1}{2} \times 1/5 \times \frac{1}{2} = 1/800$

Now compare this card test with any job around the mine or plant. Of course your chances of getting a new job done exactly right will be more than 1 in 800 because you will be more specific in your instructions. Nevertheless, the omission of any important detail multiplies your chances of failure. **Job training can do much to divide your chances of failure.**

TRAINING THE SUPERVISOR



A PAGE FROM THE SUPERVISOR'S MANUAL

"Look over your job carefully and see if things are being done the best way possible."

At Anaconda we recognize the value of the following branches of training:

1. Training the miner to perform quality work safely, efficiently and on time.

(a) Training the new miner.

(b) Training the experienced miner.

2. Training the supervisor so that he is better fitted to train and supervise men.

3. Training the potential supervisor for operating work.

Training the Miner

Fundamentally the miner must be trained by the supervising operator who lays out the work, gives instructions, and is responsible for the miner's work and safety. This training starts with things which the miner knows, and progresses to things which he does not know. This process can be speeded up considerably if the miner receives preliminary guidance and general instructions by someone else.

The New Miner

A new miner can be turned over to a supervisor with an admonition that the man is inexperienced and therefore should not be exposed to danger. But it is much better to give the new man an induction training because such a procedure will:

(1) create a more receptive consideration by the public toward the mining industry;

(2) move up the starting point of training for the supervisor;

(3) lower the accident rate;

(4) create a better employee attitude toward a company which takes this interest in them;

(5) save the cost of training by the trial-and-error method; and

(6) save the cost of detraining poor practices, and that of retraining.

Preliminary Instruction

Preliminary instruction should include explanations of: hours of work, rates of pay, general safety rules, names of working places, tools, equipment, working apparel and services. This may be done by a hiring agent, clerk, safety engineer, or as at Anaconda, by an experienced miner who meets each new group at an appointed time each day at the Mining and Safety Exhibit, and explains each operation or piece of equipment with the actual part, model or picture of the operation.

The induction procedure should next follow up with on-the-job training. It should be in some organized training spot where the arrangement and operations are like those which the new miner will be expected to carry on in his occupation. The new man should have someone to instruct and train him in the fundamentals of safe mining. This can be done by his supervisor but, unfortunately, the regular supervisor seldom has the necessary time. It is therefore wiser to use a substitute supervisor as an instructor when he is not supervising.

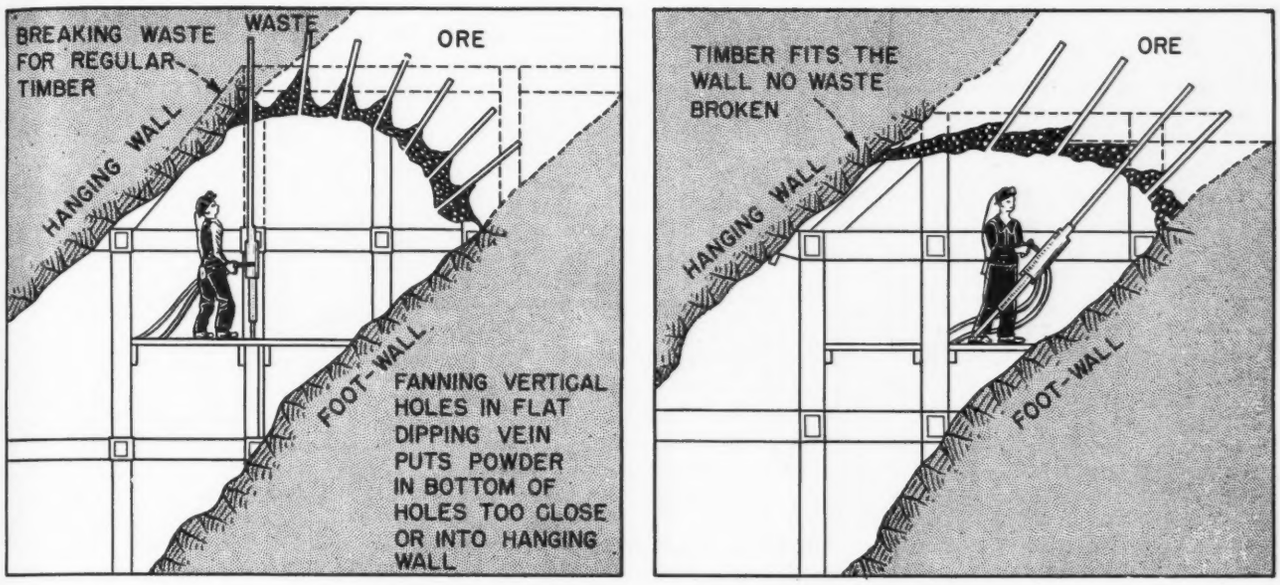
Student Stopes

The student stopes as established and operated by Anaconda provide a regularly operating area for training purposes supplemented with instructors (one to each three or four stopes), whose duty is to train the new miners. Here they are given the fundamentals of safe mining in each operation. The instructor describes and demonstrates the performance until he is sure each new miner can do each job safely. This training period averages about six weeks for the new miner. The pay rate of the trainees is the same as the base rate of pay for regular miners. There is no required output other than that the trainees show interest, willingness and ability to learn. They are in training for future contract work which will average from 20 to 60% higher pay than the base rate. After the new men graduate from this part of the training program, their training continues as they go mining on a regular contract under a supervisor who knows how much preliminary training they have had.

The Experienced Miner

It is the operating supervisor's responsibility to maintain discipline, quality, and output of work and insist upon safe practices. To obtain these results he must train the men along the lines of his ob-

TRAINING THE MINER


BREAKING WASTE FOR REGULAR TIMBER
WASTE
ORE
HANGING WALL
FOOT-WALL
FANNING VERTICAL HOLES IN FLAT DIPPING VEIN PUTS POWDER IN BOTTOM OF HOLES TOO CLOSE OR INTO HANGING WALL
TIMBER FITS THE WALL NO WASTE BROKEN
ORE
HANGING WALL
FOOT-WALL

TRAINING PICTURES FOR THE MINER

"Don't break waste for timber. Instead, drill the round to break ore only."

jectives. In this training he can be helped by other agencies which promote safety, welfare and research. In the Anaconda company, the supervisor's service aids are performed by:

(1) The bureau of safety, for instilling safety consciousness with activities, posters, pictures, safety incentive campaigns and training in first-aid and mine rescue work; (2) the engineering research department, for testing, teaching and demonstrating new equipment; and (3) the supervisors' training group, for giving the supervisors more knowledge in safety, mining methods, human relations and service practices for better training of the miner.

Training the Supervisor

The most important part of any training program is the training of the operating supervisor—a key man in the training operation. He represents the company to the miner, and he is the man who gets the work done safely and efficiently. He is the one who is instrumental in holding men, creating teamwork and co-operation, and straightening out petty gripes before they can explode into major grievances. Fundamentally, the training of the supervisor is the responsibility of the supervisor's boss. The supervisor's boss is usually a busy man, and he can generally accomplish most in the least time by group training. The following are aids in this work:

(1) periodic meetings with the supervisors in which operations and accidents are reviewed, production and costs are analyzed and discussed, all with the objective of improvement;

(2) display of accident, production and cost charts in the supervisor's surface office;

(3) bulletin boards or blackboards for emphasizing certain instructions or plans;

(4) exhibits of models in the mine office or construction in the mine yard of some desirable operating arrangement;

(5) manuals, safety rules, or practice hand-books;

(6) personalized letters from the management to the supervisors;

(7) commercial training programs;

(8) letters or bulletins from commercial training organizations. The supervisor's boss can be assisted in these training activities by a safety engineer, safety department, utility engineer or assistant. The plan operated by the Anaconda company not only conducts its operating training but also includes the consolidation of some of the activities listed above with more individual training than is otherwise possible. This is accomplished by:

(9) a supervisor's school; and

(10) an operating training program for the technical graduate.

Supervisors School

The Supervisors School was established to give them more individual attention and detailed information than they can get on the job. Here one or two supervisors from each mine meet at a central conference room for three full days, and participate in courses covering safety, mining methods, human relations and service.

These courses are given by a training group representing the operating department. The material may cover subjects pertinent to local mining operations. It is presented in the form of talks by management or in conferences, and supplemented by drawings, pictures, sound slides, motion pictures and mine models. Each group visits operating places which have unusually good safety and production records. These courses are given approximately every six months.

Material given to supervisors includes:

Safety: Review of current accidents with accident rates and classification, and methods of preventing recurrence. Ventilation principles and practices. Rules and practices for fire prevention. Laws and rules regarding handling, storage and distribution of explosives. Promotion of safety consciousness among workers. Job training. Standardization of safe practices for safety training. Safety rules.

Mining Methods: Cycles and efficiencies of present methods with costs, curves and charts. Ore samples and shipping grades, effects of waste dilution. Co-ordination of units and labor distribution. Train-

ing techniques and problems. Job method improvement. Features and applications of new equipment. Care and maintenance of equipment. Standardization with respect to layout, method and use of material. Procedure and objectives of new methods.

Human Relations: Job satisfaction, teamwork and co-operation. Explanation of operation of the contract system so that it can be thoroughly explained to the miners for maximum earnings. Company rules and policies. Union agreements and grievance procedure. Labor turnover.

Service: Standard procedure for service to the miner: Scheduling, ordering, and delivery of tools, equipment, cars, timber and supplies. Standard layouts of turnouts, switches, chutes, car dumps. Care and usage of service equipment, tool lockers, tool crates, powder cars. Timing and delivery of waste for filling.

Personal notebooks are supplied to each supervisor containing standard rules, layouts, methods, procedures and practices and are labeled "Notes of Standard Practice." They are partly in print and partly in blank, the part in blank to be written in by the supervisor for mental emphasis and retention.

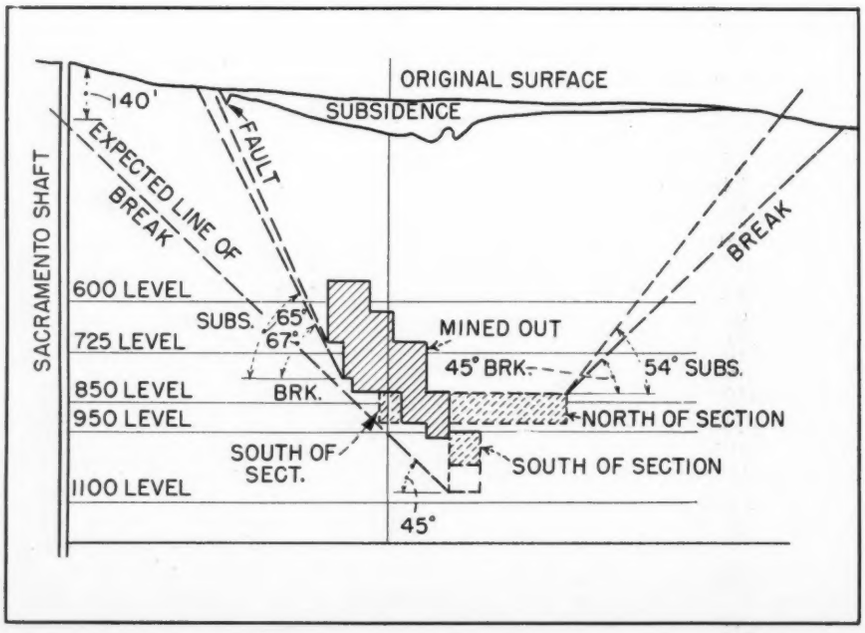
Training the Technical Graduate

The operating training program for the technical graduate was established in order to have technical men for operating positions who have had practical mining experience and departmental training relating to operating work. It functions as follows: The graduate makes application to the manager of mines to enlist in the program, stating scholastic and practical experience, special interests and activities, experience relating to handling men, and ambitions. This application is passed on by the general superintendent of mines, the production foreman and the training foreman. If approved, the trainee undergoes approximately a six months' actual mining period—two months in stopes, two months in drifts, and two months in raises. Following this, the trainee spends six months in the mine sampling department, six months in the mining engineering department, and six months in the engineering research department on mining research. At the end of this time, if the trainee has shown willingness to work, interest, initiative, steady habits and resourcefulness, he is given a job as shift boss and is then a participant in the regular supervisors training program. His status from then on will depend upon the application that he makes of his education, training and ability.

Conclusion

There is no one best way to apply the foregoing principles in any operation because each mine, mill, or smelter has its own peculiar problems. But it is certain that each operation can institute some kind of a program which will actually train men to do their jobs better and safely. This type of work is perpetual in nature, but so are its rewards, viz.: reduced accidents and compensation costs, manpower conservation, better job relations, reduced labor turnover, better efficiency and a streamlined method of adapting new methods to a constantly changing picture in mining operations.

Geological Studies Can Avoid Costly Mistakes



SUBSIDENCE at Copper Queen mine, Phelps Dodge Corp. (Trans., A.I.M.E.)

Laboratory testing appears a promising field for research. Data on physical properties of rocks will help with problems

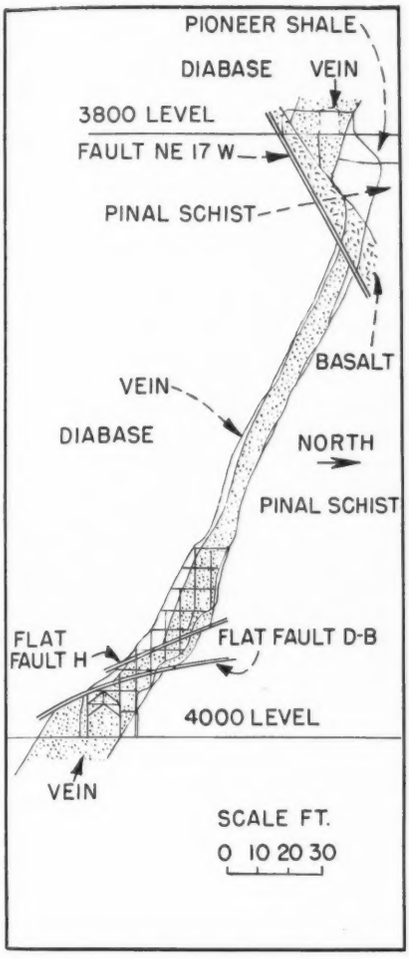
GEORGE B. CLARK

Assistant Prof. of Mining Engineering

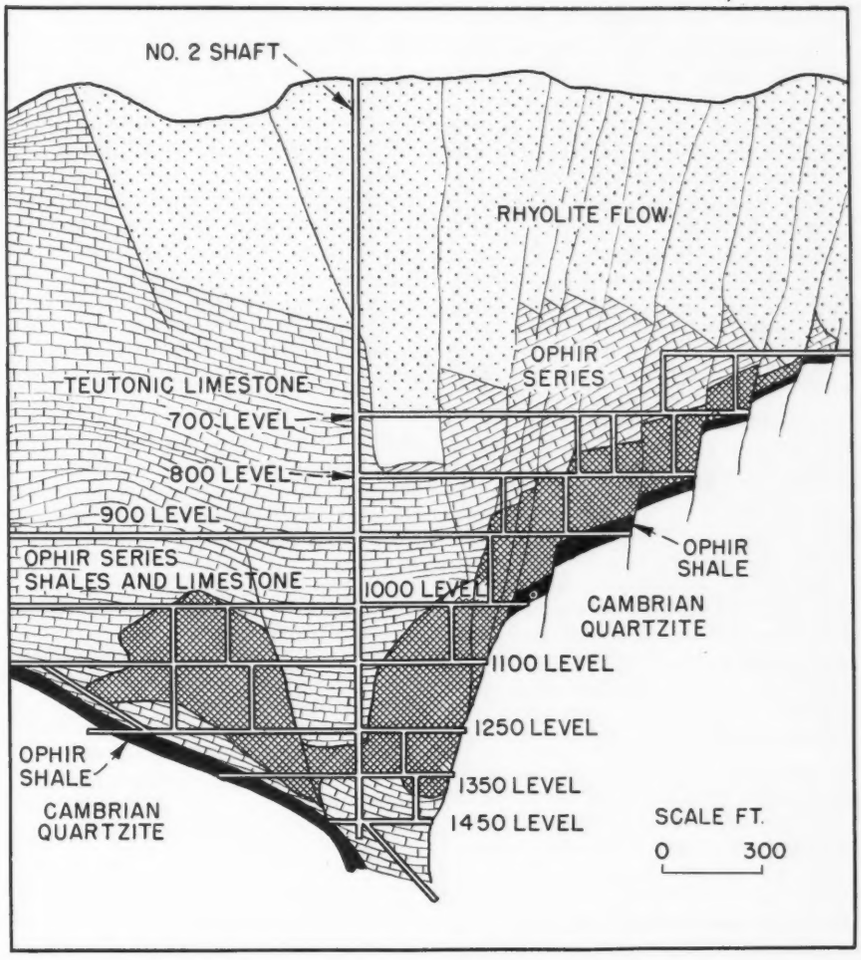
University of Illinois

EXPERIENCE HAS DEMONSTRATED that it is wise to make detailed geological studies before undertaking mine development and to maintain geological investigation during development and mining operations. Failure to do this has caused some properties substantial losses.

The following are important operational factors (other than ex-



MAGMA VEIN in cross section showing geological structure which affects mining operations (After Michell)



TINTIC STANDARD MINE, an ideal section on N 45 deg. E line through No. 2 shaft (U.S.B.M., Inf. Cir.). When operations began different ideas were held about the geology from those later developed.

ploration) which are closely related to geology: 1. Placing preliminary openings to best advantage. 2. Placing permanent openings in solid, firm rock. 3. Stope planning. 4. Maintenance of mine openings. 5. Location of openings to avoid water. 6. Furnishing information for mine valuation. 7. Safety of mining operations. 8. Choice of mining method.

In many of our mining schools, mining and geology are taught as separate courses by separate departments, and it is left up to the individual student in most cases to see the correlation between the two subjects. Unfortunately, most students have not had enough experience or educational background to bring the principles of the two together in order to form an accurate concept of their relative and joint importance. Consequently, very few graduates leave school with the realization that certain phases of mining engineering are dependent upon an understanding of geology.

A recent statement from an official[1] of a large mining company declared: "We are very much interested in this subject as I know of several instances where the selection of the wrong method of mining cost a great deal of money. Closer cooperation between mining and geological departments would have disclosed the existence of unfavorable structural conditions, and a more suitable mining method would have been adopted."

The following factors affecting a choice of mining method are important: 1. Size and shape of orebody and amount of overburden. 2. Disposition, location, strike and dip of deposit. 3. Strength and physical character of ore. 4. Strength and physical character of surrounding rock. 5. Grade and type of ore. 6. Drainage. 7. Economic factors such as cost of supplies, safety, equipment, labor, type of ore treatment, etc.

Of these factors only the last is relatively unaffected by geological conditions. The others are directly related. Any of these conditions may vary locally throughout the deposit so that different methods may be required to mine different sections of the ore. On the other hand, the existence of uniform geological conditions throughout the deposit may make the employment of only one method most economical for a mining property.

When new deposits are found, the most effective methods of mining should be employed as early as possible to keep the over-all cost per unit of metal produced at a minimum and to permit maximum extraction of ore. In production operations, as well as in prospecting and exploration, a knowledge of local geology will play a vital part in the successful solution of the problem involved in producing ore at the lowest possible cost per ton. Regardless of the structural simplicity or the complexity of any ore deposit, the method of mining which can be employed to extract the ore most economically will be

1. Personal communication, R. J. Ennis, Vice Pres. and Genl. Mgr., McIntyre Porcupine Mines, Ltd., Schumacher, Ontario, Can.

determined by geological factors.

For example, Sales[2] says of mines in the Butte district, "The structural features affecting choice of mining methods are joint planes, faulting, including structure faults, alteration of the granite within and along the veins, and numerous small slips and movement planes associated with the orebodies. . . . It is the alteration and fault movement which cause the Butte veins to require timber."

Changing Methods Is Costly

The mines, large and small, which have been forced to change their method of mining at high cost after a short period of operation are numerous. A few examples will illustrate the points outlined above.

The Tintic Standard mine in the East Tintic district of central Utah has been one of the important silver and lead producing mines in this country. The orebodies consist of massive deposits in limestones and shales overlain by altered limestone and porphyry. The whole structure is cut by a series of step faults (post mineral). The complete geology was not known or considered of vital importance when operations were begun, so it was assumed erroneously that the replacement orebodies were similar to those in the West Tintic district, which required relatively little support in stoping and mining operations. The deposit was mined by simply following the rich high-grade ore, which developed stopes as irregularly shaped cavities in larger masses of low-grade material. The system of mining employed both open stopes and light square-sets, the latter being used mainly as scaffolding. No effort was made to mine the ore systematically or to provide support for the hanging wall.

Later, improved treatment facilities made it possible to mine lower grade ores, so in 1921 filling of stoped areas was commenced to attempt to preserve the unmined ore. However, subsidence had already begun, resulting in severe caving within and adjacent to the mined ground. Both shrinkage stoping and the Michell system of mining were tried without success. Square-set stoping with back filling was finally tested and it proved successful. But continued subsidence remained a problem in shaft maintenance and maintenance of underground openings.

2. Personal communication. Reno H. Sales, Anaconda Copper Mining Co., Butte, Mont.

The lesson learned from the experience at this mine is obvious: If the geology of the orebody had been studied and understood as it became exposed by underground openings and before mining operations had caused a large amount of subsidence and caving, over-all costs per ton of mining ore could have been reduced in terms of a considerable saving of time, ore and capital during the entire subsequent history of the mine.

The objectives of geological work at the Magma mine in Arizona illustrate recent progressive trends in applied geology at some mines, and are summarized as follows:[3] 1. Giving direct assistance to the mining department by predicting possible size, shape, grade and location of orebodies. 2. Providing intelligent guidance for exploration programs, especially diamond drilling in undeveloped sections of the mine. 3. Contributing to the understanding of the general geology of the deposit, particularly the ore genesis, structure and mineral relationships. 4. Providing assistance in stoping operations. Small post-ore faults which have displaced the vein about 15 to 20 ft., present obstacles to efficient mining operations. Raises and stopes must be planned to permit extraction of the ore on both sides of a fault without crossing through the fault itself, as crossing the fault zone would require stoping or raising in fractured, heavy ore which would be difficult to support.

Structure Studies Needed

Present day knowledge of roof-control in coal mines is very limited. As an example, fatalities from roof-falls in coal mines in Illinois represent a large percentage of the total fatalities in the coal mining industry.[4] General types of roof instability which result from geological influence point emphatically toward the importance of rock structure in roof control.

Numerous mines have been forced to abandon operating shafts because of subsidence of ground over stoped-out areas. Other shafts have been saved from destruction by the presence of a fault between the shaft and the subsiding blocks. The Sacramento shaft at the Copper Queen mine[5] continued in operation because of a steeply dipping fault which interrupted subsidence before it reached the expected line of break.

In addition to these examples, it could be shown quite readily that mining operation problems in every mine are either simplified or complicated by the character of local rock structure. In most standard works on mining this relationship is taught or exemplified by vague implication when its importance should dictate a considerable amount of emphasis. There is a tendency to present recitation of details of mining practices over the world with little or no complete discussion as to the physical reasons for their use, except perhaps a brief statement that rock or ore is "heavy" or firm, fractured or solid.

Physical Data Important

The importance of geological studies to mining operations would be better appreciated if textbooks and teaching methods stressed the quantitative side of geology more effectively, particularly the applications of physics and chemistry to geological problems. Admittedly, the fact that ore deposits are seldom, if ever, in homogeneous, unfractured material, and thus a large part of laboratory data cannot be directly applied to underground conditions. Nevertheless, laboratory testing, such as is now being conducted by the U. S. Bureau of Mines and by Harvard and Columbia universities, represents one of the most promising fields for research. Data on strength of rocks and other physical properties such as creep, compressibility, density, porosity and strength when subjected to stresses under ordinary and high confining pressures, will assist materially in throwing more light on rock-burst problems, support problems, roof-falls and many others. An appraisal of stresses in rock around mine openings on a more quantitative basis appears as a possibility which may not be too remote. This type of valuable information has a definite place in both mining engineering education and mining engineering practice. Students of today, who are the men of science of tomorrow, should acquire a background in this type of *fundamentals* and their application if progress is to be made.

3. Michell, Wilson D., Applied Geology at the Magma Mine, Superior, Ariz. AIME TP 2214, Sept., 1947.

4. Roley, Rolf W., Certain Geological Conditions That Cause Coal Mining Fatalities. Illinois Engineer, pp. 7-9, Jan., 1947.

5. Kantner, W H., Surface Subsidence Over the Porphyry Caving Blocks, Phelps Dodge Corp., Copper Queen Branch. AIME Trans. 109: 181, 1934.

MARKETS—Trends and Prices

Copper, Lead, Zinc and Nickel Prices Sharply Higher; Rise Attributed to Upward Trend in Operating Costs

HIGHER COSTS were given as the main reason for the sharp advance in prices of major non-ferrous metals that occurred late in July. Most wage agreements concluded during the month granted an increase of 12c. in the hourly rate. Other cost factors, such as fuel and transportation charges, also were up. The strong situation in major metals that has obtained throughout the second quarter and the first month of the third quarter was intensified by widespread talk of a general rise in prices. Under these circumstances the consumer purchased all of the copper, lead and zinc that he could obtain. Moreover, producers were not at all inclined to book business involving forward shipment metal except on the basis of price prevailing on date of shipment or at the monthly average. As July ended, higher prices were posted for copper, lead, zinc, nickel and platinum. The E&MJ index of non-ferrous metal prices advanced from 162.30 in June to 164.55 in July.

The steel industry abolished the basing-point system of quoting prices. United States Steel took the initiative in this unexpected move. In announcing the change, Benjamin F. Fairless, president of the corporation, said:

"The abandonment of the basing-point method of selling steel—a merchandising practice not resulting from collusion, but one which has developed naturally by evolution in the steel industry over a period of 50 years to the mutual advantage of both steel producers and consumers — is made necessary by the recent decision of the Supreme Court of the United States in the proceeding brought by the Federal Trade Commission against members of the cement industry. In that case, the Supreme Court held that the basing-point delivered price system employed in the cement industry (which is generally similar to that now in use in the steel industry) is an unfair trade practice which the Federal Trade Commission may suppress." Before the end of the month, leading steel producers increased prices for steel products about 9.6% because of higher wage rates, transportation charges, and the cost of coal, scrap, and other purchased goods and services.

The basing-point system was a live topic of discussion in non-ferrous metal circles, but no conclusions were reached. The need for a definite price for settling on purchases of ores, concentrates, and scrap by smelters and refiners is such that the matter of shifting to an f.o.b. basis would be far more disturbing than in most other lines.

Anti-inflation measures were introduced at the special session of Congress that convened on July 26. The suggestion that prices on scarce materials, including metals, should be rolled back to the level of November, 1947, was looked upon as an impossible task by metal producers.

Lead Price Jumps

To augment their supplies of lead, consumers abandoned all pretense about maintaining an orderly market. They purchased scrap at a substantial premium, and obtained foreign refined lead at prices ranging from 19½c. to 22c. per pound. Leading producers here maintained the quotation at 17½c., New York, until July 28, when the American Smelting & Refining Co. jumped its published quotation 2c. per pound, establishing the market at 19½c., a new all-time high. A strike at the Flat River and Herculaneum properties of St. Joseph Lead caused that company to limit its sales and further complicate the supply situation. Soon after the New York quotation was raised, the St. Louis price became established at 19.30c. Lead for export was quotable at 19¼c., f.a.s. Gulf ports.

Domestic lead consumption (primary and secondary) averaged 91,674 tons a month in the first four months of 1948, according to the Bureau of Mines. In the same period, it was estimated that total supply available for consumption averaged slightly more than 100,000 tons a month. Allowing for some error in both figures, a few observers are beginning to wonder whether the demand-supply situation in lead has been quite as strong as the movement of prices would indicate. It was thought that "fear" buying must have been a factor in lifting the price to such extraordinary levels. Though several consumers have been limiting the use of lead, others appear to stand ready to take all of the metal that is available regardless of price.

Zinc Finally Moves

Pressure for a higher price for zinc has existed in some sectors of the market since early April. For a time the uncertainty over the fate of the Premium Price Plan caused high-cost operators to postpone action. Then wage demands became a factor. However, on July 28 the American Zinc, Lead & Smelting Co. announced that it has raised its quotation for Prime Western at 15c. per pound, East St. Louis, a new high for the movement. On that day, the Joplin ore market advanced from $78 per ton of blende, basis 60%, to $95. This move, together with increased wage rates and higher prices for fuel and other supplies, was given as the reason for the 3c. advance in slab zinc. With output well sold up, opposition to the sharp advance in prices was of no practical value. Some important producers felt that use of zinc in die casting will suffer because of increased competition with other materials.

Shipments of zinc-base die castings in the first five months of 1948 totaled 187,393,000 lb., against 197,588,-

Refined Lead Production by Countries

(American Bureau of Metal Statistics)

The following accounting of refined lead production is essentially on the basis of primary refineries. Production in the United States includes derivation from imported ore and base bullion, as well as some scrap. Figures in tons.

	Dec. 1947	Jan. 1948	Feb. 1948	March 1948	April 1948	May 1948
United States	49,337	50,821	43,598	50,093	49,652	50,626
Canada	13,806	10,845	10,645	13,409	12,885	13,081
Mexico	18,514	15,797	20,157	6,270	16,670	13,062
Argentina	2,098	2,476	1,770	2,156	2,463	2,143
Peru	3,671	3,575	3,407	3,368	3,268	2,835
Belgium	4,302	5,235	6,048	5,963	....	....
France	2,280	5,291	3,235	3,600	....	....
Germany (Br. Zone)	2,544	1,931	3,135	....	....	....
Italy	2,110	1,991	1,544	1,553	2,318	2,368
Poland	1,209	1,453	....	....	....	....
Spain	3,481	2,104	2,012	1,801	3,983	....
Japan	896	827	919	1,005	....	....
Australia (a)	11,415	14,892	16,185	13,644	18,030	....
Tunis	302	....	....	....	....	....
Rhodesia	1,277	1,271	907	1,294	1,176	1,366
Totals	117,242	....	....	....	....	....

(a) Production credited to Australia includes lead refined in England from Australian base bullion.

000 lb. in the same period a year ago, the Bureau of the Census reports.

Copper Advances

Independent domestic producers, claiming real hardship as a result of steadily mounting costs, advanced their selling basis for copper to 23½c. per pound, Connecticut Valley, effective July 29. That a price adjustment was likely was generally anticipated, but few in the industry expected the movement to get going much before the middle of August because of pending wage agreements. Large producers were sold up so far as August copper was concerned, resulting in a rather thin market. Our weighted averages for the last two days of July indicate that most of the business placed during this period was at the higher level.

Based on figures compiled for the fabricating division of the copper industry, consumption of the metal in the first half of 1948 averaged 118,686 tons a month, an extraordinary peacetime performance.

Effective July 22, International Nickel raised its United States contract price of electrolytic nickel to 40c. per pound, f.o.b. Port Colborne, Ontario, an advance of 6¼c. The price includes the import duty. Mining of lower grade ores and higher costs were responsible for the rise. Platinum advanced during July from $75 an ounce to $93 as selling pressure diminished and consumer buying improved. Quicksilver remained unsettled, despite an advance in the Cartel's selling basis of $2 per flask. The metal sold here at $75 per flask, immediate delivery.

Major Metals

U. S. DAILY AND AVERAGE PRICES

1948 July	Electrolytic Copper Domestic (a) Refinery	Electrolytic Copper Export (b) Refinery	Straits Tin New York	Lead New York	Lead St. Louis	Zinc East St. Louis
1	21.200	21.725	103.000	17.500	17.300	12.000
2	21.200	21.675	103.000	17.500	17.300	12.000
3	No Market	21.675	103.000	17.500	17.300	12.000
5	Holiday	21.675	Holiday	Holiday	Holiday	Holiday
6	21.200	21.550	103.000	17.500	17.300	12.000
7	21.200	21.750	103.000	17.500	17.300	12.000
8	21.200	21.475	103.000	17.500	17.300	12.000
9	21.200	21.425	103.000	17.500	17.300	12.000
10	No Market	21.425	103.000	17.500	17.300	12.000
12	21.200	21.500	103.000	17.500	17.300	12.000
13	21.200	21.475	103.000	17.500	17.300	12.000
14	21.200	21.500	103.000	17.500	17.300	12.000
15	21.200	21.925	103.000	17.500	17.300	12.000
16	21.200	21.625	103.000	17.500	17.300	12.000
17	No Market	21.625	103.000	17.500	17.300	12.000
19	21.200	21.450	103.000	17.500	17.300	12.000
20	21.200	21.425	103.000	17.500	17.300	12.000
21	21.200	21.425	103.000	17.500	17.300	12.000
22	21.200	21.500	103.000	17.500	17.300	12.000
23	21.200	21.925	103.000	17.500	17.300	12.000
24	No Market	21.800	103.000	17.500	17.300	12.000
26	21.200	21.925	103.000	17.500	17.300	12.000
27	21.200	22.175	103.000	17.500	17.300	12.000
28	21.200	21.600	103.000	19.500	19.300	15.000
29	22.925	21.425	103.000	19.500	19.300	15.000
30	23.150	22.175	103.000	19.500	19.300	15.000
31	No Market	22.175	103.000	19.500	19.300	15.000
AVERAGES FOR MONTH						
July	21.375	21.668	103.000	17.808	17.608	12.462
AVERAGES FOR WEEK						
July						
7	21.200	21.675	103.000	17.500	17.300	12.000
14	21.200	21.467	103.000	17.500	17.300	12.000
21	21.200	21.579	103.000	17.500	17.300	12.000
28	21.200	21.821	103.000	17.833	17.633	12.500
CALENDAR WEEK AVERAGES						
July						
3	21.200	21.725	103.000	17.500	17.300	12.000
10	21.200	21.550	103.000	17.500	17.300	12.000
17	21.200	21.608	103.000	17.500	17.300	12.000
24	21.200	21.588	103.000	17.500	17.300	12.000
31	21.935	21.913	103.000	18.833	18.633	14.000

Silver, Gold and Sterling

DAILY AND AVERAGE PRICES

1948 July	Sterling Exchange "Checks"	Silver (c) New York	Silver (c) London	Gold London	Gold (d) United States
1	402.750	74.625	45d.	172s. 3d.	$35.00
2	402.750	74.625	45d.	172s. 3d.	35.00
3	(e)	(e)	(e)	(e)	35.00
5	Holiday	Holiday	45d.	172s. 3d.	Holiday
6	402.750	74.625	45d.	172s. 3d.	35.00
7	402.750	74.625	45d.	172s. 3d.	35.00
8	402.750	74.625	45d.	172s. 3d.	35.00
9	402.750	74.625	45d.	172s. 3d.	35.00
10	(e)	(e)	(e)	(e)	35.00
12	402.750	74.625	45d.	172s. 3d.	35.00
13	402.750	74.625	45d.	172s. 3d.	35.00
14	402.750	74.625	45d.	172s. 3d.	35.00
15	402.750	74.625	45d.	172s. 3d.	35.00
16	402.750	74.625	45d.	172s. 3d.	35.00
17	(e)	(e)	(e)	(e)	35.00
19	402.750	74.625	45d.	172s. 3d.	35.00
20	402.750	74.625	45d.	172s. 3d.	35.00
21	402.750	74.625	45d.	172s. 3d.	35.00
22	402.750	74.625	45d.	172s. 3d.	35.00
23	402.750	74.625	45d.	172s. 3d.	35.00
24	(e)	(e)	(e)	(e)	35.00
26	402.750	74.625	45d.	172s. 3d.	35.00
27	402.750	74.625	45d.	172s. 3d.	35.00
28	402.750	74.625	45d.	172s. 3d.	35.00
29	402.750	74.625	45d.	172s. 3d.	35.00
30	402.750	74.625	45d.	172s. 3d.	35.00
31	(e)	(e)	(e)	(e)	35.00
AVERAGES FOR MONTH					
July	402.750	74.625	45d.	—	$35.00
AVERAGES FOR WEEK					
July					
7	402.750	74.625	—	—	
14	402.750	74.625	—	—	
21	402.750	74.625	—	—	
28	402.750	74.625	—	—	

Calendar week averages: New York Silver: July 3rd, 74.625; 10th, 74.625; 17th, 74.625; 24th, 74.625; 31st, 74.625.

(e) No market (Saturday).

THE above quotations for major non-ferrous metals are our appraisal of the important United States markets, based on sales reported by producers and agencies. They are reduced to the basis of cash, New York or St. Louis. All prices, except gold and silver, are in cents per pound.

(a) Net prices at refineries on Atlantic seaboard. To arrive at the delivered New England basis add 0.300c. per pound, the average differential for delivery charges.

(b) Our export quotation for copper reflects prices obtaining in the open market and is based on sales in the foreign market reduced to the f.o.b. refinery equivalent, Atlantic seaboard. On f.a.s. transactions we deduct 0.075c. for lighterage, etc., to arrive at the f.o.b. refinery quotation.

Copper, lead and zinc quotations are based on sales for both prompt and future deliveries; tin quotations are for prompt delivery only.

Quotations for copper are for the ordinary forms of wirebars and ingot bars; cathodes are sold at a discount of 0.125c.

Quotations for zinc are for ordinary Prime Western brands. Zinc in New York commands a premium over the St. Louis basis equal to the freight differential. Contract prices for High Grade zinc delivered in the East and Middle West in nearly all instances command a premium of 1c. per pound over the current market for the Prime Western but not less than 1c. over the *Engineering and Mining Journal's* average quotation for Prime Western for the previous month; the premium on Special High Grade in most instances is 1¼c.

Quotations for lead are for common lead.

(c) Determined by Handy & Harman on the basis of market prices for bar silver, in cents per troy ounce .999 fine, in amounts of 50,000 oz. or more, nearby delivery, New York. Price quoted is in cents and one-eighth cent fractions and is usually about one-quarter cent below the market to allow for delivery, carrying, and marketing. In addition to foreign silver, the quotation also applies to domestic and Treasury silver if such silver enters into the market. The Treasury's purchase price of newly mined domestic silver 90.5c. per troy ounce 1000 fine, effective July 1, 1946. London silver in pence per troy ounce, basis .999 fine.

(d) U. S. Treasury's gold price. Actual payment by the United States Treasury for gold in domestic and imported ore or concentrate is at 99.75 per cent of the price quoted by the Treasury, which is equal to $34.9125.

MARKETS—Trends and Prices

Miscellaneous Metals

(Monthly Averages)

Average prices of miscellaneous metals for May and June:

	June	July
Quicksilver, N. Y., flask	76.000	75.423
Antimony (a)	38.170	38.170
Antimony, bulk, Laredo	35.000	35.000
Antimony, in cases, Laredo	35.500	35.500
Antimony, Chinese (b)	....	....
Platinum, oz. troy	82.154	89.154
Cadmium (c)	175.000	175.000
Cadmium (d)	177.500	177.500
Cadmium (e)	180.000	180.000
Aluminum, ingot	15.115	16.000
Magnesium, ingot	20.500	20.500

(a) New York, packed in cases, in lots of 5 tons or more but less than a carload. (b) Nominal. (c) Producer's price for commercial sticks. (d) Average producers' and platers' quotations. (e) Special shapes sold to platers.

E. & M. J. Weighted Index of Non-Ferrous Metal Prices

(100 is composite for 1922-3-4. Copper, Lead, Zinc, Tin, Silver, Nickel, Aluminum)

1938	73.67	1943	88.74
1939	77.71	1944	88.74
1940	79.22	1945	90.86
1941	83.49	1946	110.06
1942	86.80	1947	149.46

	1946	1947	1948
January	96.42	140.88	154.20
February	96.42	140.42	155.63
March	96.42	150.71	155.63
April	96.42	153.14	160.67
May	96.42	154.03	161.33
June	107.16	150.05	162.30
July	117.11	148.73	164.55
August	113.32	149.35	....
September	113.32	150.80	....
October	114.25	151.05	....
November	131.23	151.92	....
December	142.19	152.48	....

Official London Prices

Since Dec. 18, 1939, the British Ministry of Supply has named maximum delivered prices for the major non-ferrous metals. Prevailing delivered prices for consumers in the United Kingdom follow:

	Per Long Ton £	s.	d.
COPPER:			
Electrolytic, high conductivity	132	0	0
Fire refined, high conductivity	132	0	0
Fire refined, high grade	131	10	0
Fire refined, min. 99.2 percent	131	0	0
Fire refined, min. 99.7	130	10	0
Hot rolled black wire rods	138	0	0
LEAD:			
Soft, foreign, duty paid	90	0	0
Soft, Empire	90	0	0
English refined	91	10	0
ZINC:			
Foreign (G.o.b.), duty paid	75	0	0
Domestic (G.o.b.)	75	0	0
Prime Western and debased	75	0	0
Refined and electrolytic	75	15	0
Minimum 99.99 percent	77	5	0
TIN:			
Ingot, 99 percent	569	0	0

Miscellaneous Metals, Ores, Minerals

Quotations cover wholesale lots, prompt shipment, f.o.b. New York unless otherwise stated

MISCELLANEOUS METALS

(July 31, 1948)

Aluminum, ingot, 99 plus percent, lb. (base price)	16c.
Antimony, spot, lb., 5 tons and up but less than carload, in cases	38.17c.
Bismuth, ton lots, lb.	$2.00
Cadmium, commercial sticks, lb.	$1.75
Calcium, lb., ton lots, 98 percent, cast	$1.95
Chromium, 97 percent grade, lb., spot	$1.02
Cobalt, 97 to 99 percent, per lb.	$1.65
Indium, troy oz.	$2.25
Nickel, electrolytic cathodes, lb., f.o.b. Port Colborne (a)	40c.
Magnesium, 99.8 percent, carloads, lb., producer's plant	20½c.
Palladium, troy oz.	$24.00
Platinum (Official quotation wholesale lots), troy oz.	$93.00
Quicksilver, flask of 76 lbs., 25 flasks or more	$75.00
Selenium, 99.5 percent, lb.	$2.00
Silicon, minimum 97 percent, spot, carloads, lb.	14.75c.
Tellurium, lb.	$1.75 nom.
Thallium, 100 lb. or more, lb.	$15.00
Titanium, 96 to 98 percent, lb.	$6.00@$7.00

(a) Includes U. S. duty.

METALLIC ORES

Beryllium Ore, 10 to 12% BeO, f.o.b. mine, per unit	$20.00@$24.00
Chrome Ore, per long ton, f.o.b. cars Atl. ports, dry	
48% Cr_2O_3, 2.8 to 1 ratio	$34.00@$35.00
48% Cr_2O_3, 3 to 1 ratio	$38.00@$42.00
Iron Ore, Lake Superior, Lower Lake ports, long ton:	
Old Range bessemer	$6.60
Mesabi bessemer	$6.35
Old Range non-bessemer	$6.45
Mesabi, non-bessemer	$6.20
Lead (Galena), 80 percent, Joplin, Mo., ton	$257.37
Manganese Ore—Per long ton unit of Mn. basis 48 percent manganese, subject to premiums and penalties, f.o.b. cars Atlantic and Gulf ports, duty paid, 67.6@72.6c.	
Molybdenum Ore, 90%, per lb. of MoS_2 f.o.b. mines	45c.
Tungsten Ore, per unit of WO_3:	
Foreign, 60 percent, duty paid	$24.25@$24.50
Domestic, scheelite, 60 percent and upward	$28.00
Vanadium Ore, per lb. of contained V_2O_5 f.o.b. mines	27½c.
Zinc Ore, Prime, 60 percent concentrate, Joplin, Mo., per ton	$95

METALLIC COMPOUNDS

Arsenious Oxide (arsenic trioxide) lb., in bbl., carload lots, delivered	6¼c.
Cobalt Oxide, 70 to 71 percent, lb., ceramic grade	$1.27@$1.30
Copper Sulphate, 100 lb.	$7.60

ALLOYS

Beryllium Copper, 4 percent Be, per lb. of contained Be	$20.50
Ferrochrome, 65 to 69 percent, per lb. of Cr contained	18.60c.
Ferromanganese, 78 to 82 percent, gross ton	$145.00
Ferromolybdenum, 55 to 65 percent Mo, lb. of Mo, contained	95c.
Ferrosilicon, 50 percent, per lb. of contained Si	9.3c.
Ferrotungsten, 75 to 80 percent, lb. of W contained	$2.25
Ferrovanadium, per lb. of V delivered	$2.90
Silicomanganese, 1½ percent C, per lb. contracts	7.8c.
Spiegeleisen, per long ton, 19@21%	$52.00

NON-METALLIC MINERALS

Asbestos, f.o.b. Canada (Quebec) mines (U. S. funds), ton:	
Crude No. 1	$896@$960
Crude No. 2	$350@$545
Spinning fibers	$204@$378
Paper stock	$51@$78
Shorts	$24@$46
Vermont, f.o.b. Hyde Park:	
Shingle stock	$97.00@$107.00
Paper stock	$68.50@$85.00
Waste	$51.00
Refuse or shorts	$25.50@$46.50
Barytes, f.o.b. mines:	
Georgia, crude, per long ton	$11.50@$12.00
Missouri, 93 to 94 percent $BaSO_4$, per short ton	$9.00@$9.25
Bauxite, long ton:	
Domestic, crude, 50 to 52 percent (not dried)	$4.00@$5.00
Domestic, chemical, 55 to 58 percent	(a)$8.50@$9.00
Domestic, abrasive, 80 to 84 percent	$16.50
China Clay, f.o.b. mines, ton:	
South Carolina and Georgia, No. 1, airfloated, bulk	$7.50@$8.50
North Carolina, ceramic grade	$18@$22
Feldspar, bulk ton:	
Potash feldspar, 200 mesh	$17.00
Glass spar, white, 20 mesh	$11.75@$12.50
Fluorspar, f.o.b. mines, bulk, Kentucky and Illinois,	
70 percent, all rail movement, ton	$35.00
Acid 97.5 and 1 percent, bulk, ton	$42.00
Fuller's earth, f.o.b. Georgia or Florida, ton	$7.00@$14.00
Magnesite, per ton dead-burned, f.o.b. Washington	$31
Mica—Domestic f.o.b. mines. Punch, 6 to 15 c. per lb. according to size and quality. Sheet, clear, 1½ x 2 inch, 60 to 65c.; 2 to 2 inch, 95c. to $1; 2 x 3 inch, $1.35; 3 x 3 inch, $1.80; 3 x 4 inch, $2.25; 3 x 5 inch $3.; 4 x 6 inch, $4; 6 x 8 inch, $6. Wet ground, very fine, $125@$155 per ton. Bulk sales, dry ground, $40@$80 per ton. Scrap, $30 and up.	
Ocher, Georgia, ton, in sacks	$24.00
Pyrites, Spanish, per long ton unit of S, cif. Atlantic ports	(a)12@14c.
Sulphur, Texas, mines, long ton	$16.00@$18.00
Talc, f.o.b. works, ton:	
New York, purified	$18.50@$20.00
Vermont, extra white	$12.50
Tripoli, Missouri, ton:	
40 mesh, cream colored	$14.50

(a) Nominal.

IRON AND STEEL

Pig iron, Valley furnaces, gross ton: Basic	$39.00
Steel, f.o.b., Pittsburgh billets, net ton	$45.00
Structural shapes, 100 lb.	$2.80

WASHINGTON REFLECTIONS

McGraw-Hill Washington News Bureau

Uranium in Public Lands Open to Development

Uranium deposits found on public lands will be thrown open to development by private operators, the Atomic Energy Commission announced late in July in its semi-annual report to Congress. Although the AEC is getting most of its ore from foreign sources, it is pushing a program of domestic development, both to find new sources of uranium, and to develop better means of handling low-grade ores.

Elements of AEC's domestic program include: 1, a ten-year guaranteed price for uranium ores, concentrates, and refined metal; 2, a $10,000 bonus for discovery of new high-grade deposits of uranium ore; 3, a three-year guaranteed price for low-grade ores; 4, AEC-operation of three plants for processing low-grade ores. These plants will be running within a year, and ore is being stockpiled meanwhile.

Contracts for Stockpiles May Pay More for Metal

A new long-term procurement plan, designed to bring out "a little more production" so that metal can be put into the stockpile without cutting into normal domestic industrial supply, will be announced by the military establishment shortly.

Although details of the plan were still secret, its general tenor was apparent in late July. Essentially, the idea is to offer metal producers a long-term contract (five years or so) for a specified amount of material that would result from that producer's expanding facilities. The contract would specify a price that would allow new facilities to be amortized during the life of the contract.

New producers, or marginal ones who could not quite make the grade at market prices, would be given a contract that would allow them to stay in business. These deals, like those to going producers, would be worked out by negotiation.

The old Buy-American Act, which has been interpreted to allow a maximum 25% differential to American materials over foreign goods, is being used as the authority for the new contract idea. Heretofore the stockpilers had shied away from any contract longer than a year or so, and were very tough on price clauses.

Procurement people drafting the new plan point out to prospective contractors that the 25% differential provided by Buy-American will be allowed in very few cases, if in any. In most cases the "plus" side of the contract will amount to "only a few percent" over current market prices. Where new facilities are to be installed by the contractor, the terms will be market price plus that percentage needed to write off the cost of the new machinery during the life of the contract.

Stockpilers don't expect miracles of their new idea, but they are hoping for some increase in the flow of materials into the pile. One big source of strategic materials, the ECA countries and their possessions, should start swelling the stockpile within a few years. The Economic Cooperation Administration has a special department designed to help strategic producers outside Europe clear production bottlenecks and expand output. Aid to these producers is expected to be tied to a "contract" arrangement similar to that soon to be offered domestic producers.

The Boyd Appointment

We remind our readers that James Boyd has still not been confirmed by the Senate in his position as Director of the U. S. Bureau of Mines. He continues to serve without salary, as he has for the past seven months, under an interim appointment by President Truman.

Mr. Boyd's confirmation is held up not for lack of confidence in his ability, but simply because John L. Lewis was not consulted when the appointment was made. Mr. Boyd has given ample demonstration of his fitness for the post by his successful conduct of it, during what must be for him a severely trying period.

It is not Mr. Boyd alone who is being tested here, but the very American way of doing things. Members of the mining industry who want to see simple justice done, who resent the interference of a single man's willfulness, and who do not care to see Congressional action blocked by the personal vanity of that one man, should write their senators demanding the confirmation of James Boyd as Director of the U. S. Bureau of Mines.

President Must Settle Draft Status of Miners

Draft policy on deferment for scientists, key technical men and labor in critical industries, such as metal mining, is shaping up rapidly in Washington.

Essential labor in mines, and other hard-pressed industries, is almost sure of deferment. The essential industry class of deferments will be handled individually at local draft boards under a Presidential directive due this month.

The position of scientists remains in doubt, mainly because of a behind-the-scenes squabble on who will have the authority to defer them in peace, and to place them properly in war. Government bureaus oppose Selective Service on this question.

The military would like to have a peacetime catalogue of all scientific personnel, with a separate office within the national defense set-up to handle all technical manpower problems. General Hershey, Selective Service director, is on the other side of the fence, advocating a self-contained draft organization very similar to the one operating in World War II.

Here is what the new draft law says about the decision. "The President is authorized, under such rules and regulations as he may prescribe, to provide for the deferment from training and service in the armed forces of the U. S. of any or all categories of employment, or those whose continued service in an office, or whose activity in study, research, or medical, scientific or other endeavors, is found necessary to the maintenance of the national health, safety or interest; provided that no person within any such category shall be deferred except upon the basis of his individual status."

Thus the decision rests with the President.

Meanwhile, surveys of the military utilization of scientists in war are about complete. A study of 21 biological sciences has been completed. It covered 10,600 men. The non-biological scientists are being polled now. Last groups to report in are the geologists, and civil and mechanical engineers.

Grants in Majority as ECA Starts Spending

The Economic Cooperation Administration had announced procurement authorization totaling $814,477,224 by the week ending July 18. Of this, $611,373,205 was authorized for purchase by participating countries, their agents or importers, through regular trade channels. The remainder was to be procured by the Department of Agriculture, Army, Navy and the Bureau of Federal Supply. The greater part of the total will be spent in the United States.

Authorizations, including ocean and inland freight, were broken down by countries as follows: Austria, $44,-149,271; Denmark, $9,740,200; France,

$231,242,545; Bizone, Germany, $63,351,000; French Zone, $14,949,300; Greece, $32,617,140; Italy, $106,752,044; Netherlands, $48,877,564; Norway, $5,793,248; Trieste, $4,050,412; United Kingdom, $226,066,200; and China, $27,888,300.

Commodities to be procured, and their totals to date (July 16) are: wheat, $152,670,338; flour, $55,385,125; meats, $42,954,356; cheese, $15,700,000; rice, $11,620,040; other foods, $39,098,625; inedible oils and fats, $18,243,060; feeds, $4,966,350; seeds, $420,219; fertilizer, $10,315,958; coal, $66,539,000; petroleum products, $106,714,914; cotton, $63,007,200; other fibers, $2,103,820; tobacco, $21,776,000; medicine and chemicals, $16,745,980; non-metallic minerals, $3,149,000; non-ferrous metals, including nickel and aluminum, $51,811,760; iron and steel, $14,140,759; agricultural and industrial equipment, $91,913,767; aircraft, parts, etc., $965,000; lumber and newsprint, $10,638,350; other items, $1,027,400; inland and ocean freight, $90,581,203.

So far there has been only one loan approved, the rest of the money laid out has been in grants. This first loan, $2,300,000, went to the government of Iceland. Negotiations involving about $700,000,000 are under way with France, Italy, Denmark, the Netherlands, Dutch East Indies, Norway, the United Kingdom, and Ireland.

Increased Budget Means New Projects for USBM

A half-million dollar increase in its budget for next year has prompted the mining division of the Bureau of Mines to inaugurate four new development projects. More than 50 activities started in past years are continuing.

Most important of the new projects is development and experimental mining work with Montana chromite deposits. The work will include diamond drilling, operation of small stopes, and studies on dilution problems.

Second of the new jobs is to develop new underground mining techniques in vanadium-phosphate rock in Wyoming. The techniques will be tried in beds, dipping at 60 deg.

Drilling, trenching, sampling, and other development work with the base metals in Alaska will make up the third project.

Preliminary work on titanium ore reserves in New York, Wyoming and Arkansas will constitute the fourth new project, and will tie in with development already underway in Florida and elsewhere.

Much of the development work will be carried out cooperatively with state mining agencies, local groups and private companies.

Continuing projects, station-by-station, include: Alaska — diamond drilling for tin, two copper and three lead-zinc projects; Albany, Ore., development of a chromite, one tungsten, and two lead-zinc prospects in Washington, Montana, and Idaho; Reno, Nev., office continues investigation of California mercury and tungsten, two Nevada coppers, and a Nevada fluorspar; College Park, Md., will work on Pennsylvania graphite, New York lead-zinc, three New England coppers, and a Maine antimony deposit just discovered; Minneapolis, Minn., continues development work on old shallow lead deposits in Wisconsin, Black Hills mica, and a cataloging of old drill holes and mines in Southwest Wisconsin; Raleigh, N. C., is studying selective mining of Georgia pyrrhotite, Virginia pegmatites, tantalite, beryl and mica, and South Carolina sillimanite; Rolla, Mo., is cataloging Eastern Missouri bauxite deposits, carrying on with shallow open pit mining methods in Tri-state lead-zincs, churn drilling in Tri-state, lead-zincs, and development of Arkansas rutile; Salt Lake, Utah, is doing development work on three Colorado and two Utah lead-zincs, Wyoming vanadium and titanium; Tucson, Ariz., will work on two Arizona coppers, New Mexico lead-zinc, pegmatite and tantalite; Tuscaloosa, Ala., is continuing investigations of Alabama tin and talc.

Military Budget Won't Upset Domestic Economy

One of the worries of business, facing up to a new fiscal year, was the thought of the bite that the military's new budget would put on the economy. It looked, at first, as if military procurement would make the short supply of steel, aluminum, copper, lead and zinc, even shorter.

Now it looks as if these worries were unfounded, at least for this year. After weeks of computation the military budgeteers have come up with a set of figures that indicate little impact on the domestic economy.

Of the $14,700,000,000 in obligation authority (a drawing account) handed them by the Congress, the three services figure they can spend about $12,000,000,000 during the next 12 months. The other $2.7 billion will be held over until hard goods ordered this year are delivered in future years.

Regular "housekeeping" items, pay and allowances, food, clothing, medical care, maintenance and operation of military establishments, overhaul and repair of facilities, and administrative expenses, will make up about 75% of the money to be spent during the period. The remaining 25% will go into hard goods procurement, planes, ships, tanks, guns, etc.

The hardware category includes about $1-billion worth of aircraft to be delivered during the year, and $1.5 billion in "other" hard items ordered in small packages by the three services. Another $2 billion earmarked for planes will not leave the Treasury for several years.

Stockpiling, so far, remains the unknown quantity in the impact figuring. There is $225,000,000 available in cash for stockpiling, but the President has ordered stockpilers to go easy on the domestic market. In trying to obtain a voluntary allocation from producers, stockpilers asked first for 10%. They were turned down flat. They have been coming down the percentage ladder step by step, had dropped their request to 5% in early July, and still had no answer to their pleas. Should the Berlin situation get much worse, stockpilers might throw political caution to the winds and start outright buying on the open domestic market. If that should happen, the impact would rise into the "serious" stage fairly quickly.

The impact of military procurement, outside stockpiling, on important raw materials will be slight. Total demand for steel during the year is estimated at 1,250,000 short tons of carbon and alloy metal, or about 2.1 percent of all U. S. production of steel mill products. The Navy will use the greater part of the lot. The Air Force will use about 47/100ths of one per cent of military steel in its plane program. The remainder will be spread in driblets throughout the services for a variety of items.

The plane program for the Air Force and the Navy will call for about 4.5% of the total U.S. aluminum production. Half of this will be in sheet, 21% in forgings, 10% in extrusions, and 19% in all other shapes of metal. This much means about 2,700 planes will be delivered in the next 12 months (1,600 for the AF and 1,100 for the Navy).

Military set-aside of aluminum in the future, as the long-range plane production program blossoms, will increase heavily, reaching a peak of about 16% in 1951, when 5,200 planes are scheduled to be delivered. This figure is based on current output rate of the aluminum industry.

Compared to the fiscal 1948 figures, the breakdown of the "obligational authority" for military procurement this next fiscal year is impressive, but it does not reflect actual spending.

Military Breakdown of Congressional Budget

(Billions of dollars)

Military personnel support	1949 fiscal	1948 fiscal
Costs (pay and allowances, food, clothing, medical)..	$5.00	$4.85
Maintenance and operation of posts, camps, stations, repair and overhaul of facilities	3.60	2.95
Aircraft procurement	2.90	.96
Other major procurement..	1.50	.51
Other military housekeeping costs, contingent funds, fuel, etc.	.20	.15
Research and development.	.50	.45
Stockpiling	.525	.20
Nat. Secy. Council, Nat. Sec. Res. Bd., Office of Sel. Services, etc.	.04	...
Training 1-yr. enlistees....	.365	...
Total	$14.630	$10.070

NEWS OF THE INDUSTRY

Major Companies Throughout the Industry Strive to Reach Settlement with Unions

During the past 2 months producers and consumers alike, in the face of short supply, have watched closely the disturbed labor situation in major mining industries. July 1 marked the expiration date of many union contracts, and the beginning of certain negotiation snags.

Eagle-Picher Mining and Smelting Co. employees, comprising Local 861, MMSW, in the Tri-State district and numbering approximately 1,600, went on strike at midnight, June 30. In addition to stopping all mining and milling operations and all transportation and power facilities of the Eagle-Picher subsidiary, about 20 other mining companies shipping ore to the Central mill were forced to close.

Phelps Dodge Corp. reached agreements at all properties under MMSW contract, granting a basic wage increase of 12c. an hour, improved grievance procedures and vacation plans. The properties include Laurel Hill, N.Y.; El Paso, Texas; Tyrone, N.M.; and Bisbee, Morenci and Douglas in Arizona.

Phelps Dodge also signed a new contract with AFL granting workers of the Railroad Firemen and Trainmen and the Metal Trades Council in Arizona a 12c. hourly increase. Trainmen at Ajo and Morenci and metal trades workers represented at Douglas, Bisbee and Morenci were affected. Contracts with AFL were extended until November 1950.

American Zinc, Lead & Smelting Co. had awarded wage increases of 12½c. an hour to 150 employees at the Grandview plant, Metaline district, starting July 1; according to the western manager of the company a like raise, which with overtime gives the average worker about $30 more per month, was granted last year. The company stated, however, that beginning July 1 it would no longer recognize MMSW as the bargaining agent for employees, inasmuch as the international union would not comply with Federal laws concerning non-Communist affidavits.

On July 1, the Grandview employees went out on strike; according to Howard Lee, international representative of MMSW, the workers had struck because there was no longer a contract in force. He charged that "there are no Communists here . . . the company has raised a false issue," and the union felt the company should make the next move to end the strike.

Permanente Metals Corporation's Mead and Trentwood plants at Spokane, Wash., with 3,100 union employees, received wage increases of 9c. to 15c. an hour and health and accident insurance guaranteeing $25 a week for 13 weeks for any one injury or sickness, according to announcement in early July by a national representative of United Steelworkers of America. The benefits are retroactive to June 27. Company officials said adjustment to salaried employees also would be made.

Calumet and Hecla Consolidated Copper Co. was scheduled to discuss a new contract with local 584, MMSW, to become effective on August 1. Provisions proposed by the union were: 30c. per hour wage increase; comprehensive group insurance plan to be paid for by the company; pension plan to provide $100 a month to 60-year-old employees with 20 years of service; shift premiums of 4c. for afternoon and 6c. for night shifts.

St. Joseph Lead Co. and MMSW failed to agree on negotiations for 3,600 lead miners at Flat River and Herculaneum, Mo., and the workers walked off the job on July 7. President of the local union was quoted as saying the difficulties arose on "fringe issues," not wages.

American Smelting and Refining Co. averted a threatened strike at 14 properties, affecting 8,000 workers, on July 23 when the company settled major issues with MMSW. The agreement includes a 12c. hourly wage increase.

Anaconda Copper Mining Co. at its last meeting with the Mine Mill Anaconda Council in Montana offered a 12c raise to the western Anaconda locals, and 4 unions voted acceptance July 5. Other proposals recommended by the joint negotiating committee and accepted by members were: one additional paid holiday, making a total of 6; 2-year agreement through June 30, 1950, with a wage reopening clause on June 30, 1949; agreement on union shop protection under the law.

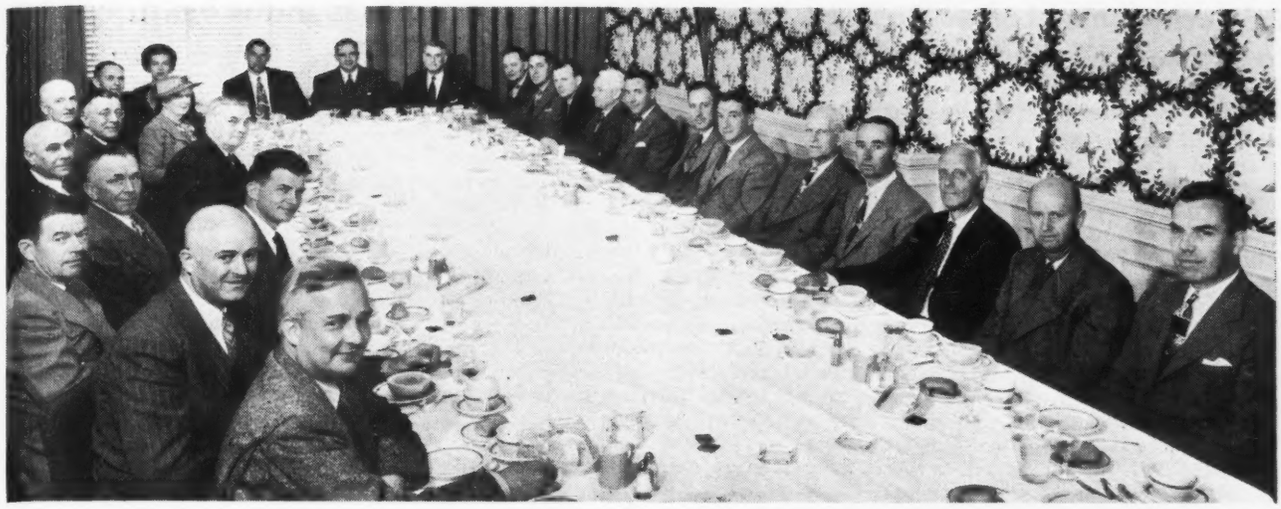
Coeur d'Alene district miners under contract with MMSW were demanding a wage increase of 30c. per hour, which would bring miners' wages from $10.69 to $13.09; muckers from $10.19 to $12.59; timbermen from $11.19 to $13.59 and timber repair men from $11.44 to $13.48. Following a strike vote, a joint negotiating committee representing 32 mining companies of the district and 3 MMSW locals reached an agreement calling for a 12c. hourly increase.

In Utah and Nevada the only locals remaining with IUMMSW, as the contract expiration date of July 1 passed, were Bingham open-pit miners, Magna-Arthur millmen and those at McGill, Ruth and Kimberly, Nev., all employees of Kennecott Copper Corporation; Tooele Smeltermen's local, employees of International Smelting and Refining Co., who are affiliated with Anaconda council of IUMMSW; and several smaller locals. Employers had declined to meet with representatives of the international union, whose officers had not filed non-Communist affidavits.

Following a strike vote taken July 2 by the Tooele Smeltermen's local, I. S. & R. Co. agreed to open negotiations on July 13 with John Clark, international president, and local union leaders. Local union officers of the Kennecott council sent letters to that company demanding negotiation, but the director of labor for Kennecott maintained that while his company would negotiate with any union representing the employees, whose officers had signed non-Communist affidavits, it would not negotiate unless such affidavits were signed.

Meanwhile 8 locals affiliated with Progressive Metalworkers' Council, and 10 which have seceded from IUMMSW but have not announced affiliation other than with the state CIO, were meeting with operators, had signed contracts or were to begin negotiations after certification by the NLRB, all with the understanding that contract terms would be retroactive to July 1. PMC on June 26 formed a district union to coordinate activities of the locals in Utah, Nevada, Idaho, Montana, Colorado, Arizona and New Mexico.

In New Mexico's Carlsbad potash basin a strike was called at the U. S. Potash Co. because of management's reduction in bonus to employees, and a strike of short duration ensued at the plant of the Potash Company of America. New contracts were bringing dissension on several issues at these plants and at the International Minerals and Chemical Corp. plant. In Grant County 3 major mining companies were faced with strike action when 2 of the company managements refused to bargain with CIO union officers until they had signed the non-Communist affidavits. Contracts expired at 2 of the operations on June 30 without negotiations on new contracts and no compliance by union officials to sign affidavits. Strikes were not immediately called but the situation was tense early in July.



MINING LEADERS from all parts of the U.S. met in San Francisco recently to map the program for the 1948 Metal Mining Convention and Exposition of the American Mining Congress. Reading from left to right are: S. H. Williston, Gordon I. Gould, C E. McWhorter, Sheldon P. Wimpfen, C. J. Abrams, H. N. How, Robt. M. Searls, P. D. I. Honeyman, Walter S. Larsh, Mrs. H. Robinson Plate (San Francisco Ladies Auxiliary of AIME), Julian D. Conover, Mrs. Carlton D. Hulin (Ladies Chairman), Worthen Bradley, E. S. McGlone, Roy A. Hardy, Neil O'Donnel, L. T. Kett, P. R. Bradley, Jr., D. H. McLaughlin, John Parks Davis, Wm. Wallace Mein, Jr., Albert F. Knorp, W. H. H. Cranmer, E. McL. Tittmann, Ira B. Joralemon, J. B. Newsom, P. D. McMurrer.

Program Committee Plans San Francisco Mining Convention and Exposition

Celebrating the golden anniversary of the American Mining Congress and the centennial of the discovery of gold in California, the 1948 Metal Mining Convention and Exposition will be held in San Francisco the week of September 20. The Civic Auditorium will house both the exhibits of mining equipment and the convention sessions, from Monday through Thursday. The exhibits will occupy the main arena and adjoining corridors, where 86 leading manufacturers have been assigned approximately 25,000 sq. ft. of space.

Friday and Saturday will be devoted to trips being planned by the Trips Committee, H. A. Sawin, chairman. These will include visits to dredging operations in the Sacramento Valley, and probably to Grass Valley and the historical Mother Lode country. Entertainment features are being arranged by the several San Francisco committees, under Worthen Bradley, general chairman. There will be a welcoming luncheon at the Civic Auditorium Monday noon, the guest speaker to be announced later.

Convention meetings will include 6 general sessions and 4 sessions devoted to operating problems. First outline of the program under date of June 30, which was subject to change, gives the topics for the general sessions as follows:

Monday Morning:
- Impact of the Rearmament and Foreign Aid Programs on American Mining Industry
- The Industry's Viewpoint on Mobilization
- Bureaucratic Obstacles to a Prosperous Mining Industry
- Reciprocal Trade Agreements—Their Effect on Mining

Monday Afternoon:
- Stabilization of World Currencies on a Gold Basis
- Place of Gold in British Empire
- Outlook for Silver and the Non-Ferrous Metals
- Status of the Strategic Metals Industries

Tuesday Afternoon:
- Review of Problems under Consideration by the National Minerals Advisory Council
- Premium Price and Subsidies
- Marginal Deposits
- Stockpiles
- Exploration and Development Incentives
- Public Lands

Wednesday Morning
- Experience Under the Taft-Hartley Law—What Further Legislation is Needed?
- Maintaining Industrial Peace—Handling of Labor Disputes
- Personnel and Public Relations Problems of the Mining Industry

Thursday Morning:
- Panel Discussion of Tax Problems of the Mining Industry
- Traffic Problems of the Mining Industry
- Non-Metallic Minerals of the West

Thursday Afternoon:
- Results of Recent Exploration and Development in Adding to Ore Reserves—
  - Northwestern States
  - Southwestern States
  - Intermountain Area
  - Mississippi Valley and Eastern States
  - Western Hemisphere
  - Iron Ores
- Cooperative Programs of Geologic Mapping
- Atomic Energy Minerals—Prospecting — Production — Governmental Policies
- Report of Resolutions Committee

Subjects of the 4 operating sessions are to be:

Monday Afternoon:
- Advances in Milling Practices

Tuesday Afternoon:
- Progress in Mechanization of Metal and Non-Metallic Mines
- Experience in the Use of Tungsten Carbide and Other New Types of Rock Bits
- High Speed Rock-Tunnel Driving by the Pacific Gas and Electric Co. on the Mokelumne and Feather Rivers

Wednesday Morning:
- Factors Affecting the Adoption of Open Pit Methods at Inspiration, Ray and Bagdad, Ariz.
- Large-scale Stripping with Dragline-Conveyor Belt Combination on the Mesabi Range of Minn.
- Gold Dredging Practices and Problems

Thursday Morning:
- The "Greater Butte Project"—Prospecting and Sampling; Block-caving tests
- Shaft-Sinking in the Coeur d'Alene District
- Mine Safety and Manpower Problems
- Development and Mining of the San Manuel Orebody

Special conferences and committee meetings will include the "secretaries' conference," with officials of both state and district associations; and an organizational meeting of the Resolutions Committee to formulate the Declaration of Policy.

Ex-Communist Leads Casting Division in Move to Secede from MMSW

Again the 108,000-member CIO Mine, Mill and Smelter Workers union is ripped apart by a large secession movement within its ranks. And again the reason is the same: Dissatisfaction with the left-wing leadership bent on following the Communist Party line.

Last year John J. Driscoll, right-wing Connecticut CIO leader, led some 40 locals with their 30,000 members out of MMSW and took most of them into the John Green's anti-Communist CIO shipbuilders' union that is rapidly becoming the "District 50" of the CIO. In addition to taking the smelting workers, it recently provided asylum for locals of government and railroad workers.

Acme Photo

KEN ECKERT

This year's defection from MMSW is headed by Ken Eckert, national chairman of the MMSW Casting Division. Representatives of 24 of the 37 locals in the division, representing 16,000 members, voted at a meeting June 26 and 27 at Toledo, Ohio, to withdraw from MMSW because of refusal of its officials to go along with the Casting Division's recommendation that the union comply with the Taft-Hartley labor law.

NLRB Rights Lost

Refusal of MMSW officers to sign non-Communist affidavits has denied its local unions the right to use the National Labor Relations Board. This has resulted in serious losses to the Casting Division. Not only has it lost many strikes, but other unions, in compliance with the law, have been able to move in as new bargaining agents through NLRB elections.

Eckert's followers decided to re-establish the National Association of Die Casting Workers by declaring illegal its merger with MMSW in 1942. Eckert was made president, and Peter Zvara, of Toledo, secretary-treasurer.

Plans call for obtaining separate affiliation with the CIO. It's not likely that a separate charter will be granted, but some way will be found to keep them in the CIO.

Eckert, who worked in Russia and was a Communist leader in Toledo, said he quit the Communist Party just before the last war because of disillusionment over Communist methods and objectives.

MMSW President John Clark immediately suspended Eckert and named Irving Dichter of New York as administrator of the Casting Division. A fight over control of union funds and records followed in Cleveland, where the new organization set up headquarters. It included the ouster of officers of Local 755 at Aluminum Company of America's Cleveland plant for participating in the alleged rump meeting in Toledo.

Eckert Gets Contract

Eckert and James E. Miller, president of Local 755, refused to recognize Clark's action, asserting that he no longer had any jurisdiction over them. Three days after the Toledo secession meeting, Local 755 renewed its agreement with Alcoa for 2 years, including a 10% wage increase. Eckert plans to put NADCW's name to the agreement after obtaining certification through a NLRB election.

Leaflets bearing the name "Communist Party of Ohio," asserting that Eckert had been expelled from the Communist Party for his betrayal of the Precision strikers, were passed around outside Alcoa gates. The Casting Division lost strikes against Precision Castings Co. in Cleveland, Fayetteville, N. Y., and Kalamazoo.

Dichter told the press that 21 of the 24 Casting Division locals had given him pledges of a desire to remain in MMSW. Only 2 locals, he said, are with Eckert. The *Union*, MMSW's official newspaper, predicted that the secession would fail; that Eckert would carry with him only the Schultz and Doehler locals in Toledo.

The union newspaper also pointed out that none of the locals had followed the new constitutional procedure for secession. This was adopted by referendum last fall because of the Driscoll-led defection. It provides that no local union may withdraw or dissolve "so long as at least 10 members in good standing object thereto." Even before it can be determined whether 10 members object, 3 months' notice of intention to withdraw must first be given to the international union's executive board. A withdrawal vote of the local can then be held only upon 10-day notice given at the end of the three months. This amendment was frankly labeled as intended to "protect the international union from secession" as well as to clarify the rights of locals to secede.

Steel Industry Adopts F.O.B. Pricing System

Despite doubt over the soundness of the move, in July the steel industry acted to abolish the controversial basing-point system of quoting prices. Without waiting for the Federal Trade Commission to take the initiative, leading steel producers evidently preferred to take this step during a period of high activity when availability is more important than price.

In announcing the change for U. S. Steel, B. F. Fairless, president, issued the following statement:

"The abandonment by the United States Steel Corporations' subsidiaries of the basing-point method of selling steel—a merchandising practice not resulting from collusion, but one which has developed naturally by evolution in the steel industry over the past 50 years to the mutual advantage of both steel producers and consumers—is made necessary by the recent decision of the Supreme Court of the United States in the proceeding brought by the Federal Trade Commission against members of the cement industry. In that case, the Supreme Court held that the basing-point delivered price system employed in the cement industry (which is generally similar to that now in use in the steel industry) is an unfair trade practice which the Federal Trade Commission may suppress.

"We have no recourse other than to comply with the law of the land as determined by the Supreme Court, regardless of the hardships and dislocations to American industry which may result. . . . In our judgment we were fully justified in meeting in good faith the price of a more favorably located competitor. Competition was stimulated and not hindered by such a practice."

May Lead Production Above 1947 Average

Mine production of recoverable lead, in short tons, in the U. S. during the first 5 months of 1948, according to the Bureau of Mines, is shown below:

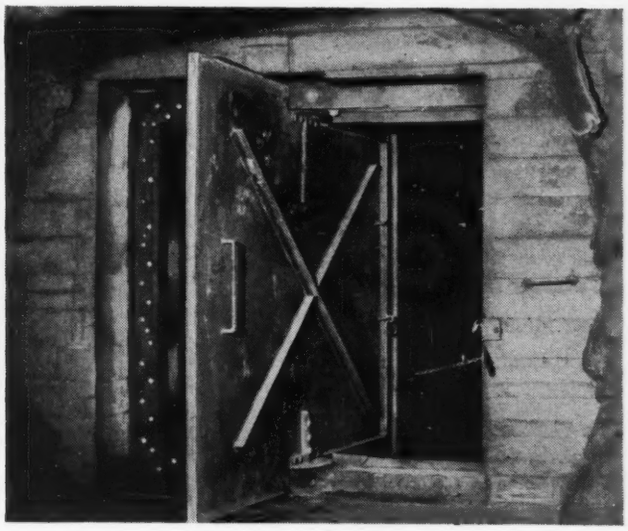
	Jan.	Feb.	Mar.	Apr.	May
E. of Miss.	895	840	851	1,186	931
Ark., Kan., Mo. & Okla.	12,111	11,832	13,423	13,136	12,336
Ariz.	2,200	2,300	2,700	2,325	2,220
Cal.	850	685	830	885	885
Colo.	1,964	1,777	1,819	1,844	1,902
Idaho	8,050	7,349	7,675	7,620	7,150
Mont.	1,335	1,430	1,485	1,510	1,485
Nev.	650	560	680	660	660
N. M.	524	475	605	616	532
Ore.	...	1	1	1	1
S. D.	...	4	...	4	...
Texas	7	4	23	25	25
Utah	4,170	4,420	4,825	4,900	4,750
Wash.	550	730	885	800	775
Total	33,306	32,407	35,802	35,512	33,652

(*Continued on Page* 150)

OPERATING IDEAS

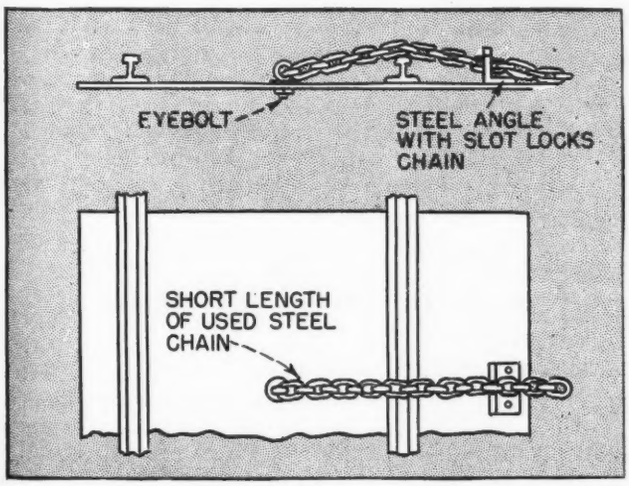
Narrow-Gage Truck

Haulage contractors cut down the width of an old standard-gage International truck chassis to approximately 46 in. as shown above to carry loads of fuel oil and other supplies over narrow mountain roads leading to the Azurite property formerly operated by the Federal Mining and Smelting Co., Wallace, Idaho. The unit shown above is receiving drums at a transfer station in preparation for a 15-mile haul over Cady Pass, Washington.



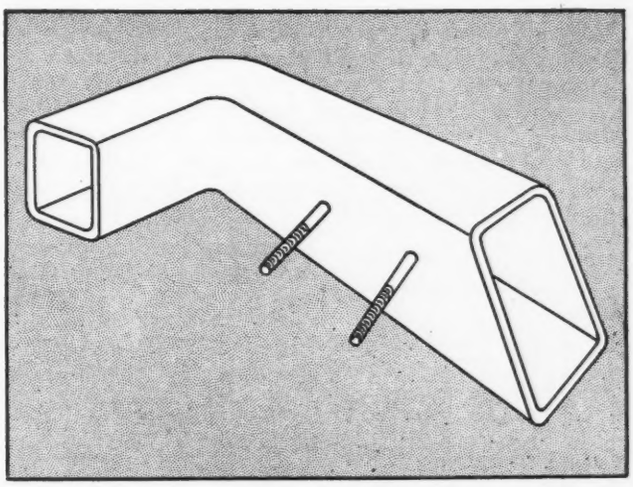
Pivoted Ventilation Door

High ventilation pressures are no obstacles to the opening and closing of this "butterfly-valve-type" ventilation door in use at underground operations of Noranda Mines, Ltd., Quebec, Canada. When the door is operated, wings on either side of the central pivot equalize the pressures acting upon the door. This advantage is most obvious when this type of door is compared with side-hinge types which often require considerable effort to open or close.



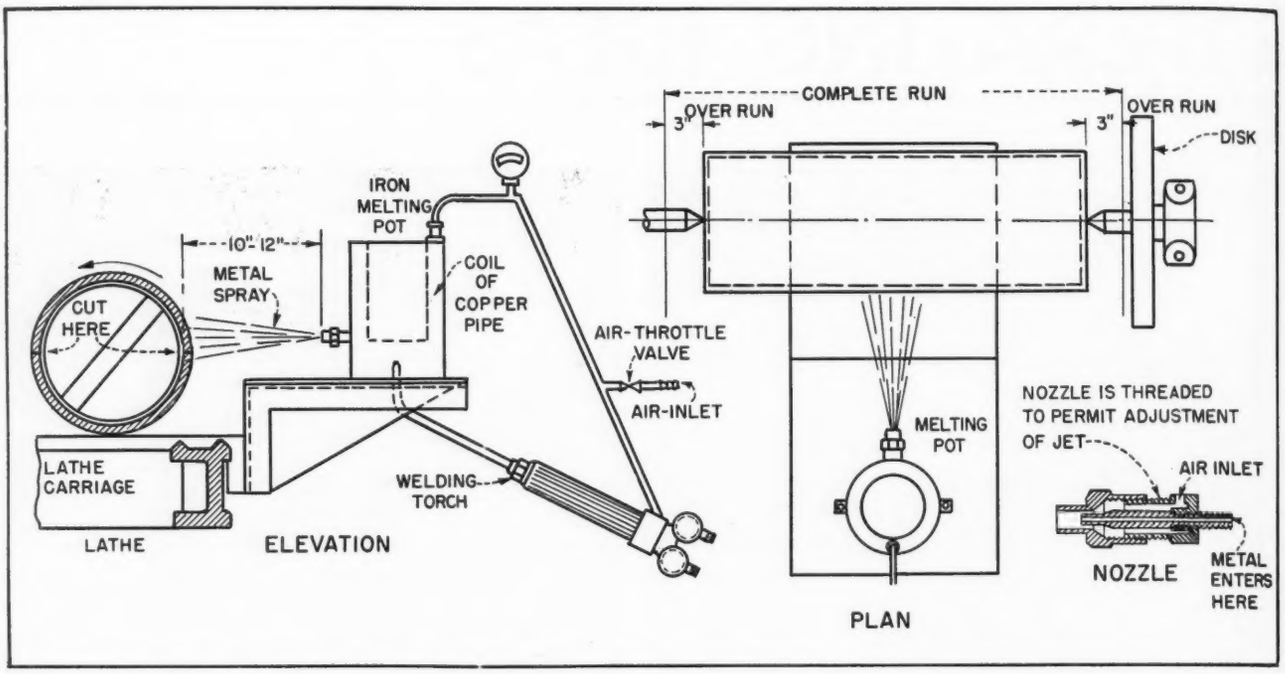
Chain Serves as Car Stop

Shaft stations of the Mayflower shaft of New Park Mining Co., Keetley, Utah, are equipped with the simple, easily made car stop shown above. The stop consists of a short length of steel chain attached at one end to an eye bolt secured to a steel plate or wooden sleeper, and a slotted steel angle which locks the loose end of the chain on the opposite side of the rail. The chain is removed only after the hoisting cage is in position to receive loaded or unloaded cars.



Scoop Unloads Ball Mill Charge

This device is used to unload 10-ton charges of balls in Krupp-type mills installed in the Stein-V lead-zinc mills at Huls, Germany, according to Report No. 654 of the British Intelligence Objectives Sub-Committee. When the mill is to be unloaded, bolts of one of the discharge end liners are removed, and the scoop is attached. Upon rotation of the mill, the balls are scooped up and discharged outside of the mill. Time required to unload the mill of a ball charge is about 20 min.



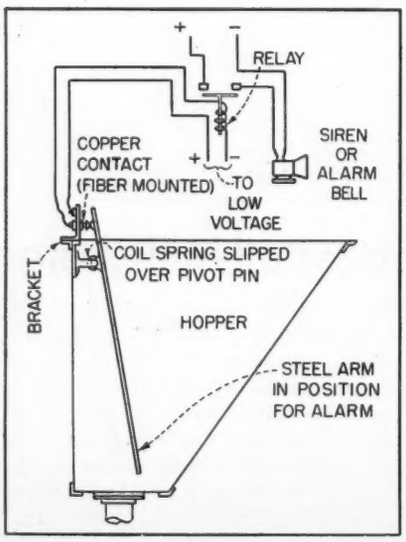
Heavy Bearing Metallized With Welding Torch

This method of metallizing heavy bearings on 42x16-in. crushing rolls was used with success at the Caracoles mill of Compagnie Aramayo de Mines en Bolivie according to Hans Pick who describes the technique.

Bearings of the lower shells are of brass, and those of the upper cup shells of babbitt. The upper cup bearing is built to meet the requirements for a poured shell. It has long and tapered grooves to keep the babbitt in place. When the babbitt in the upper bearing wears out, it must be replaced in a hurry. Consequently a metallizing method was developed to permit prefabrication of the shells and their installation without preheating and other usual preparations for pouring babbitt shells.

A piece of pipe of same diameter as the shaft is metallized as shown in the drawings. After being metallized the shell received one turn on the lathe to clean it up and bring it to the right diameter of the upper bearing part. Then the shell is cut in two with a cutting tool on the same lathe where the metallizing is done. Lubrication windows are then cut into the shell. When the shell is installed, two holes are drilled for each groove to permit air to escape. The shell is placed into the upper bearing part and hot babbitt is poured through the holes into the grooves. As the metallized shells are quite spongy, they enable the shell to retain oil, a distinct lubricating advantage.

The spray gun consists of an iron melting pot surrounded by a copper coil through which compressed air is forced, and at the same time pre-heated. The melting pot is heated with a welding torch; however it is advisable to pre-heat the babbitt in a forge to assure a continuous spray. This equipment is attached to a lathe carriage and used as shown. One section of the nozzle carries air, another carries metal, and the tip carries both. The section carrying air is threaded to permit regulation of the air jet as shown in detail in the above illustration.



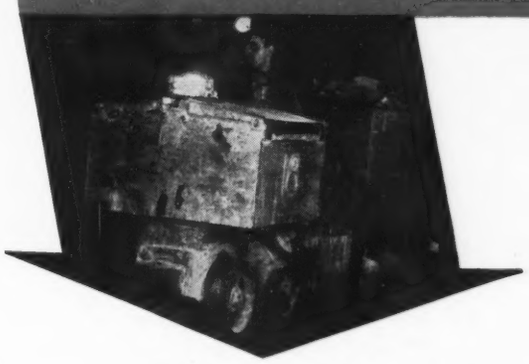
Alarm for Coal Feed Hopper

The alarm shown here has given excellent service at a steam power plant of a large mining enterprise in Mexico. The boilers used are of the pulverized-coal, unit-fired type receiving fuel from a separate pulverizing plant. Prior to installation of the alarm a near shutdown of the boiler plant was caused on several occasions when the flow of coal from the storage bunkers to the coal pulverizer feed hopper was interrupted by failure of the automatic discharge on the bunkers. Trouble was also experienced when wet coal clogged transfer chutes.

The alarm consists of a flat steel arm pivoted on a bracket attached at the edge of the hopper, and the alarm circuit. A coil spring is slipped over the pivot pin and is bent to make the arm swing out into the hopper and make contact with the fiber-mounted contact on the vertical bracket extension.

Operation is positive. When coal is in the hopper, the steel arm is held against the side of the hopper. If the hopper is empty or the coal sticks, the arm swings out into the hopper and closes the alarm circuit. The device can also be used on hoppers and feed bins handling materials other than coal.

SAFE DEPENDABLE POWER



Bring production up *fast* with battery-powered haulage units and *EXIDE-IRONCLAD BATTERIES*

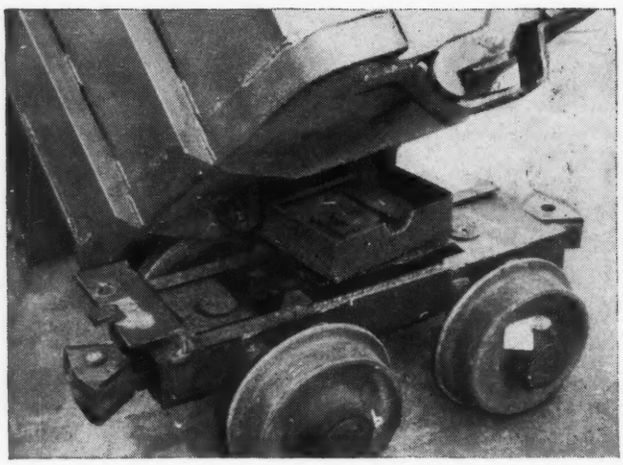
Greater tonnage, lower costs and trouble-free performance are among the reasons why battery-powered haulage units are preferred in so many mines, quarries and tunnel operations. And when the motive power is supplied by Exide-Ironclad Batteries you can count on dependable service with full shift availability day after day.

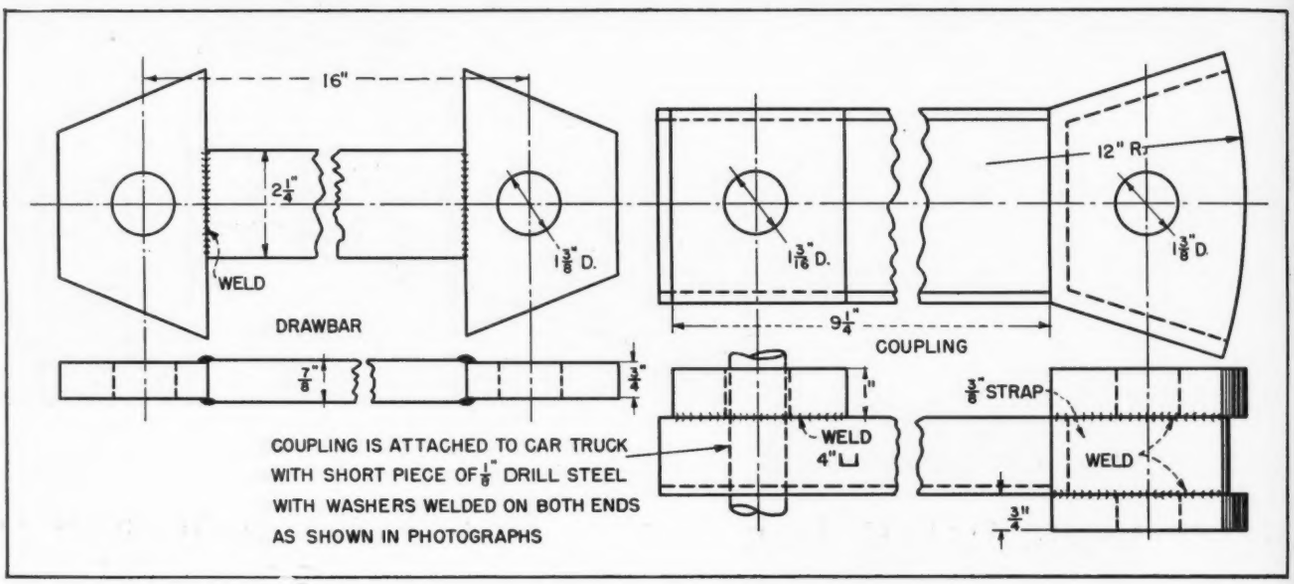
Keep production high and haulage costs low. Use battery-powered trammers, locomotives and shuttlecars. Use Exide-Ironclad Batteries. They have all four of these vital characteristics of a storage battery: high power ability, high electrical efficiency, ruggedness and long life.

1888 . . . Dependable Batteries for 60 Years . . . 1948

If you have a special battery problem, or wish more detailed information, write . . .

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • *Exide Batteries of Canada, Limited, Toronto*





Coupling Converts Tram Car Into Haulage Car

This 10½-cu. ft. dump car was fitted with shop-built couplings at St. Anthony Mining & Development Co., Ltd., Tiger, Ariz., by Earl Snodgrass, master mechanic. These couplings permit the use of drawbars so that tram cars can be joined, and pushed or pulled by a locomotive. Ore pockets at the shaft are designed so the cars dump over the side. End-dumping is prevented by the projection of the coupling.

The all-welded coupling is built up of heavy plate and mounted to permit ample swing for sharp curves. Channel and plate are welded together to form the drawbar as shown in the above illustrations.

Sheave Fitted With Demountable Rim

Dragline operating costs were cut substantially with this demountable-rim-type sheave which was devised by Frank Hefferman, general superintendent of one of Henry J. Kaiser's Western gravel plants. The 14-in. sheave shown is mounted 20 ft. from the drum and exposed to heavy abrasion caused by the 750-ft. 1-in. preformed rope traveling over it.

The improved sheave was made from a conventional 14-in. sheave by cutting off the groove and attaching a demountable rim with six ½-in. bolts. The groove is cast from medium-hard manganese steel, and can be replaced in five minutes after it is worn.

Cost of the rim and groove is $9 as compared with the $45 replacement cost of a new sheave. With a conventional sheave, the main line rope lasted 60 days, as compared with 140 days with the new sheave.

Never omit the "Composite Valve"

— in any cost-wise planning

CALL IT THE "COMPOSITE VALVE"—the giant that would result if *all* the valves in a plant were *one* valve. As pictured here, its proportion to other equipment in this detailed model of an automobile factory is fairly accurate. Representing your total valve investment, its size may surprise you, but it must be considered in any plan for economical plant operation.

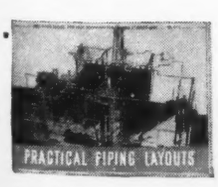
IT PAYS to keep *your* "composite valve" in mind at all times . . . and thus avoid the common error of dismissing valves as a comparatively unimportant investment. With wages and material costs the highest ever, your total valve expense warrants the same careful attention that you give to operating costs of larger plant units.

EXCESSIVE MAINTENANCE of one inferior valve is insignificant, but multiplied by thousands, it is a serious drain on operating budgets. JENKINS BROS. helps you meet this problem two ways. First, by building extra endurance into Jenkins Valves, making them the longest-lasting, lowest-upkeep valves that money can buy. Second, with advice from Jenkins Engineers on any question of proper selection, installation, or maintenance.

For all new installations, for all replacements, rely on Jenkins quality and engineering for lowest valve costs in the long run. Sold through leading Industrial Distributors.

•

Jenkins Bros., 80 White St., New York 13; Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal.



"PRACTICAL PIPING LAYOUTS" is a 32-page book containing diagrams and descriptions of 25 basic piping layouts with complete recommendations for valve selection and location in the lines. Tells you "which valve where for best performance". FREE on request. Write JENKINS BROS., 80 White Street, New York 13, N. Y.

LOOK FOR THIS TRADE JENKINS MARK DIAMOND MARK

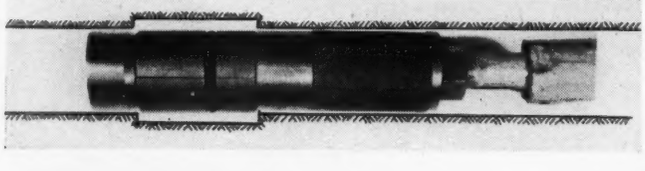
SINCE Jenkins Bros. 1864

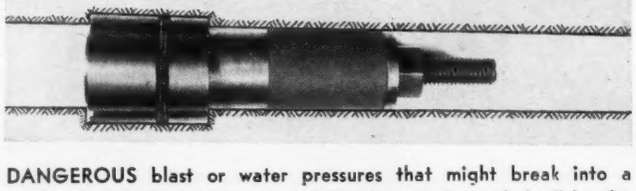
JENKINS VALVES

Types, Sizes, Pressures, Metals for Every Need

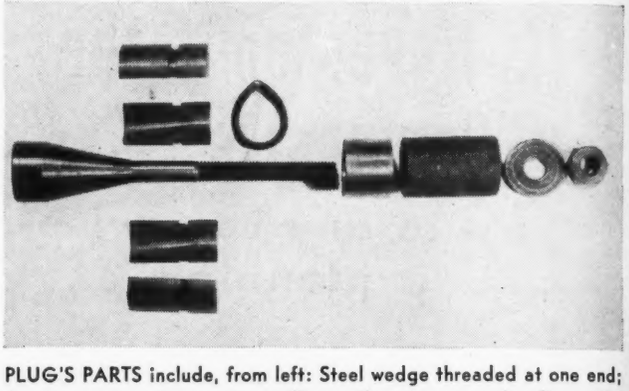
EQUIPMENT NEWS

Borehole Safety Plug Is Easily Installed

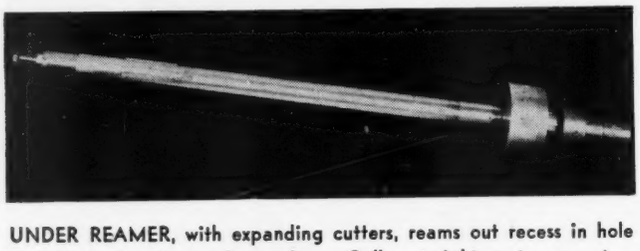




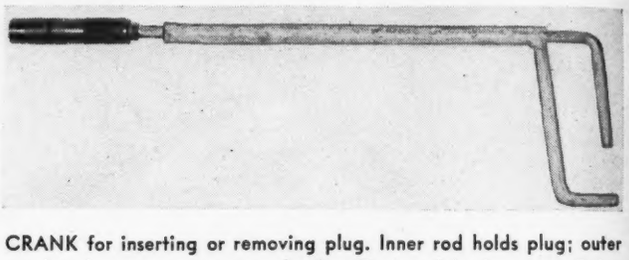
DANGEROUS blast or water pressures that might break into a working place through diamond drill holes can be sealed off by this easily-installed expandable safety plug.



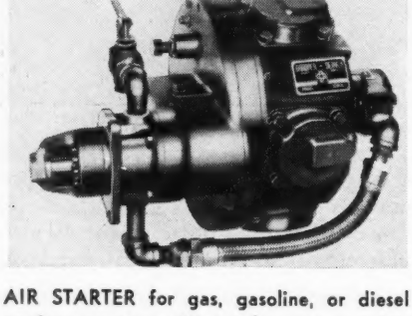
PLUG'S PARTS include, from left: Steel wedge threaded at one end; four segments of expansion collar; coil spring around collar; solid steel collar; neoprene rubber collar; washer; tightening nut.



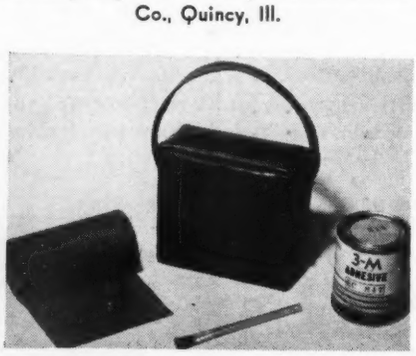
UNDER REAMER, with expanding cutters, reams out recess in hole into which plug fits as shown above. Collar at right spots recess two feet in from collar.



CRANK for inserting or removing plug. Inner rod holds plug; outer crank rod engages nut, expands plug. Designed by Lawrence F. Labow, plug is sold by Stewart Machine Works, Ltd., Noranda, Quebec.



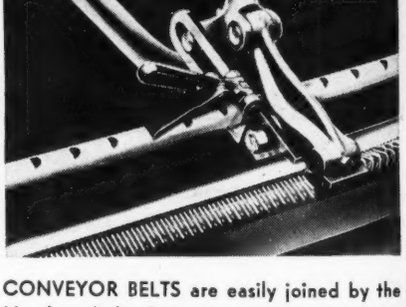
AIR STARTER for gas, gasoline, or diesel engines assures positive, safe engagement in cranking engine. Made by Gardner-Denver Co., Quincy, Ill.



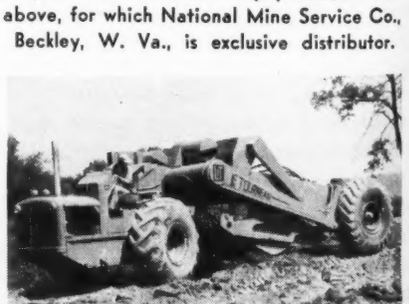
REPAIR KIT for Mine Vent flexible tubing is offered by American Brattice Cloth Corp., Warsaw, Ind., for $3.15, shipment prepaid. Includes carrying case, can of cement, brush, 4 yd. of patching cloth.

Column Bar Uses Ratchet

Canadian drillers have cut setting-up and tearing-down time by using the Purdie column bar shown here. The column can be raised in 60 seconds by means of the patented ratchet, gear and pinion at the base of the bar. During drilling, the handle shown is removed. George Purdie, mechanical superintendent, Lake Shore Mines, Ltd., invented the bar. It is now manufactured by Inspiration Mining & Development Co., Ltd., North Bay, Ontario, Can.



CONVEYOR BELTS are easily joined by the Hayden belt fastener equipment, shown above, for which National Mine Service Co., Beckley, W. Va., is exclusive distributor.



ELECTRIC CONTROL of steering, scraper bowl, apron and tailgate is provided in new LeTourneau 150-hp. Tournapull and 13.3-cu. yd. Carryall scraper. Individual motors handle each function, give unusual ease of control. Transmission is constant mesh.

(*Continued on p.* 112)

Longer Life . . . Less Maintenance for PENN Truck Bodies with J&L JALLOY

HEAT-TREATED STEEL

J&L STEEL

Leading Dump-Truck Body Builder Pioneers Use of Heat-Treated Steel for Bottom Plates

Hockensmith Corporation, Penn Body Division, of Penn, Pa., puts real meaning in its slogan: "*Strength · Service · Economy*" by using J&L Jalloy and Otiscoloy steels.

J&L Heat-Treated Jalloy for truck bottoms resists the terrific shocks and abrasion encountered in heavy-duty operations, while J&L Otiscoloy High-Tensile Steel frame members and other parts reduce dead-weight to a minimum without sacrificing strength.

One mine operator reports that his stone trucks equipped with heat-treated Jalloy run an entire season without bottom replacements—an unheard of record in the mining industry where the materials handled are highly abrasive. In addition because longer wear reduces repair, his maintenance welding crew has been cut *84%* since using Jalloy!

J&L Jalloy is a *modern* steel for products that must be tough and strong—heavy-duty truck bodies, power-shovel buckets, dump-cars, bulldozers, scrapers, rock crushers, sand-blast equipment, and wherever abrasion is a limiting factor in the life of a product.

J&L Jalloy—a fine-grain, heat-treated steel—has an inherent ability to withstand impact and abrasion. A wide range of physical properties, with strengths up to *155,000 lbs. per sq. inch*, are available.

If you need a steel with *better* abrasion resistance, or if you want longer life from products made of steel, let us send you data on J&L Jalloy, including information on properties, heat-treatments and workability. The data booklet: "Jalloy—J&L Alloy Steel" is available on request. Use the coupon.

Jones & Laughlin Steel Corporation
Room 412, Jones & Laughlin Building
Pittsburgh 30, Pennsylvania

Please send me complete data on Jalloy and the booklet: "Jalloy—J&L Alloy Steel."

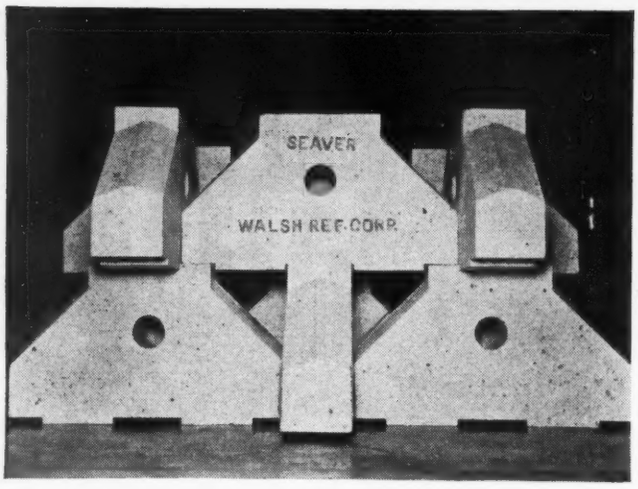
NAME_____

TITLE_____

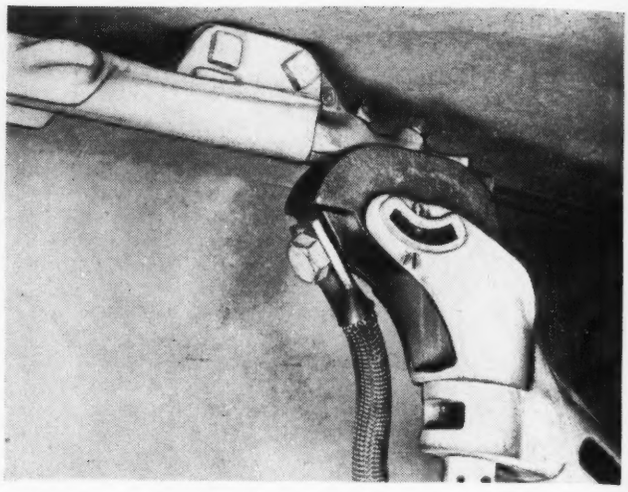
ADDRESS_____

CITY_____ STATE_____

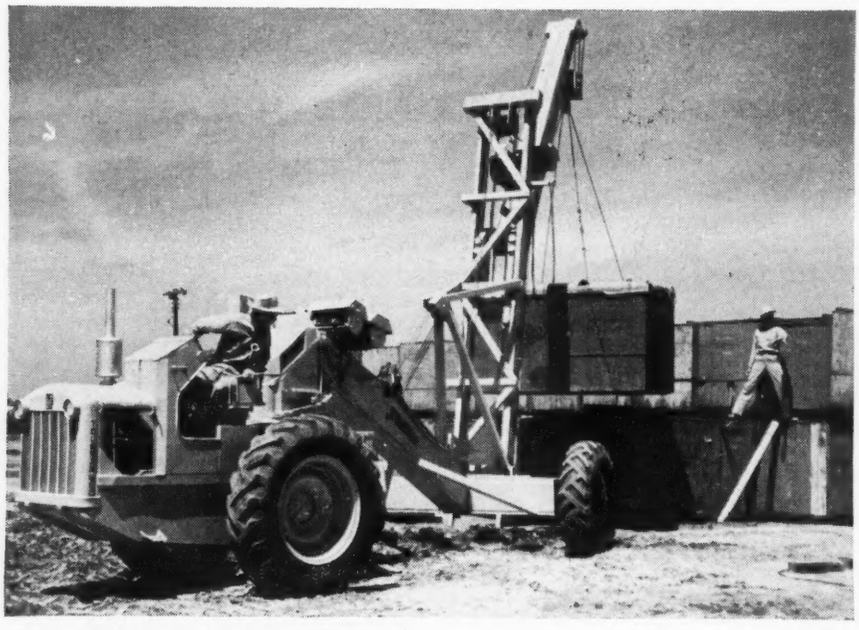
JONES & LAUGHLIN STEEL CORPORATION



MORE HEATING SURFACE for hot blast stoves is provided by the Seaver checker brick, which have 30% more heating space than plain brick checkers. For details, write Jay J. Seaver Engineers, 53 West Jackson Blvd., Chicago 4, Ill.



SMOOTH CONNECTION between wire and frog runner features new Type-M trolley frog of Ohio Brass Co., Mansfield 3, Ohio. Bouncing and arcing of collector at frog are eliminated. Locomotives need not slow down passing through these frogs.



MOBILE CRANE can lift and carry up to 7 tons. It has maximum lift of 29 ft. 6 in., can carry load safely across country or on highway. It is Model EC-7 Tournacrane, made by R. G. LeTourneau, Inc., Peoria, Ill.

Electric Delay Cap

A new waterproof and gasless electric delay blasting cap, to be used for rotation firing of successive shots, has been announced by Western Cartridge Co., East Alton, Ill. Made in 10 delays, the new cap uses RDX or Cyclonite as its explosive charge. A zero-delay cap provides an eleventh interval of delay.

The new Western cap is loaded in a one-piece single diameter metal tube. No vent is needed to allow proper burning of the delay element because the ignition mixture is gasless. The cap is available in all standard wire lengths in both spool and loop types with double cotton-covered enameled copper wire with tinned ends to facilitate attachment.

Nylon-Coated Wire Rope

Steel wire rope coated with nylon is now being produced in diameters ranging from 1/32-in. to 1-in, or greater, by Rochester Ropes, Inc., Culpeper, Va. Forming a solid coating of extreme toughness, the nylon sheath is said to add materially to the rope's ability to withstand corrosion and fatigue stresses. In fatigue tests, a bare steel cable was virtually destroyed after 60,000 reversals. Under the same testing conditions, a nylon-coated cable of the same construction suffered only one broken strand after the same abuse. Prices for the new cable, called Wirelon, will about equal those for stainless steel cables of the same outside diameter.

Temperature Controller

An electronic temperature controller, said to be simple, fast and precise, is now being manufactured by the Instrument Division of Thomas A. Edison, Inc., West Orange, N. J. The device, which is non-indicating, uses a single electronic tube with an electrical resistance type bulb for thermal pick-up. Units are available to cover temperature control in solids, liquids, or gases in the range between minus 100 deg. F. and 1,200 deg. F.

Medium-Weight Breaker

Designed for horizontal operations in demolition work, a new medium-weight concrete-breaker, the B-67, was announced recently by the Gardner-Denver Co. Weighing 63 lb., the new breaker incorporates a safety latch on the throttle to prevent accidental operation of the hammer when moving the breaker about the job with live air on the line. It is said to be suitable for boulder-breaking in quarries or mines, for trenching in shale or hardpan, and for general demolition work. It is equipped with a lubricator of sufficient capacity for several hours' operation on one filling.

Heavy Air Hose

Development of a Condor Homo-Flex heavy-duty air hose, designed especially for the rugged service met in mining and quarrying operations, was announced recently by Manhattan Rubber Division, Raybestos-Manhattan, Inc., Passaic, N. J. The new hose has an extra-strong tube made of Manhattan oil-proof Flexlastic, two braids of a strength member, and a thick abrasive-resistant oil-proof cover, yet it is said to retain the feature of flexibility. Two sizes, ¾-in. and 1-in. inside diameter, are made. Working pressures are 350 and 300 lb., respectively. (*Cont. on p.* 114)

For *STEPPED-UP* TONNAGE

NEW 30-TON MACK

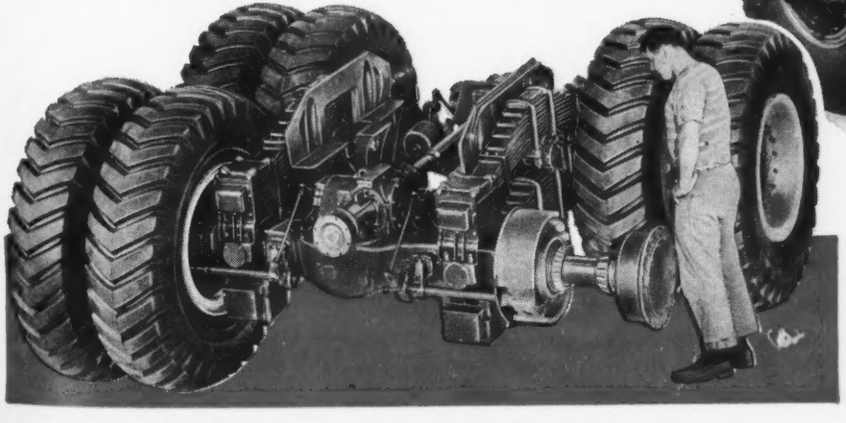
• Mack's new Model LRSW packs a 30-ton payload in its monster dump body — or pulls 55 tons as a tractor semi-trailer.

Big 275 h.p. super-charged Diesel keeps tonnage moving away from the shovels — fast. Massive frame is of alloy steel, reinforced and welded into one piece; built to stand up under the stiffest punishment. Mack's famed Balanced Bogie with exclusive Power Divider assures positive traction over difficult terrain and through slippery mud. Power steering and air-assist clutch mean easy handling, less driver fatigue, better maneuverability, safe and sure control. Roomy, all-steel cab has offset driver's seat for better vision.

No other off-highway truck offers you so many outstanding features and advantages. No other manufacturer but Mack designs and builds so many of its components in its own factories — your assurance of trucks that are perfectly co-ordinated for utmost efficiency.

Let us give you full information in terms of your particular operation. Write or call your nearest Mack branch or dealer.

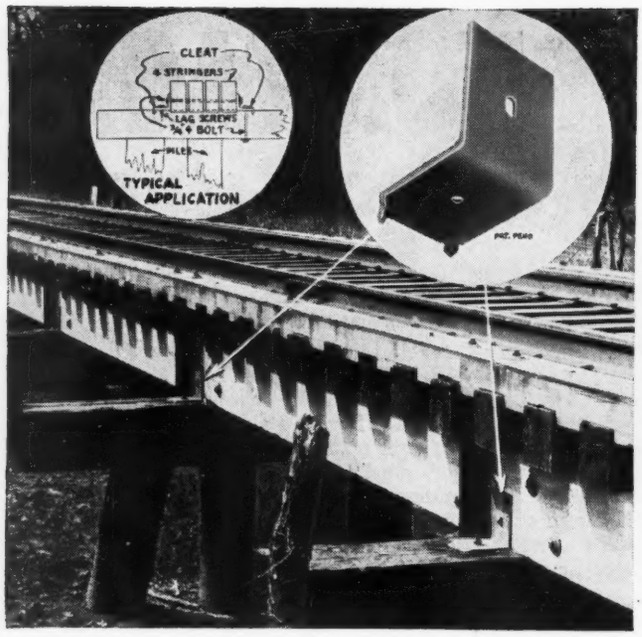
Here's the famous Mack Balanced Bogie with the exclusive Power Divider which brings new standards of performance to off-highway hauling. Unusual flexibility and balance insure even tire loading, uniform braking and equal traction on all four wheels. Maintenance is reduced to a minimum because of functional design.



Mack

TRUCKS FOR EVERY PURPOSE

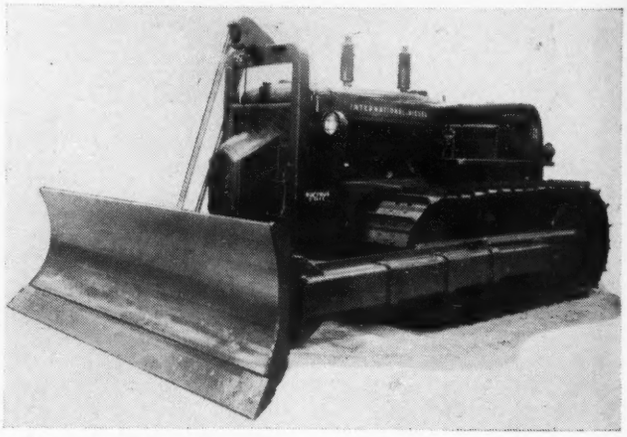
Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa., Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada, Mack Trucks of Canada, Ltd.



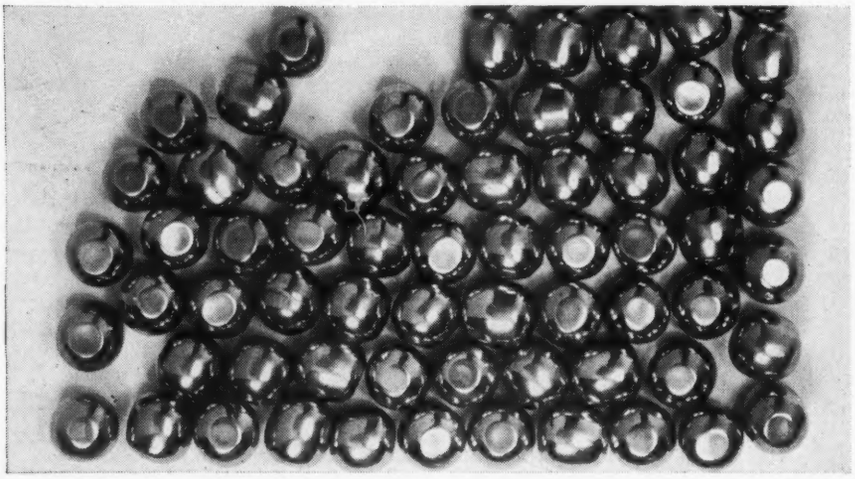
TIMBER STRUCTURES of all kinds, including mine timbering, are said to be made stronger and steadier by the Peyton cleat shown above. The spurs, visible in the photograph, seal in the cleat. For details, write National Dunnage Co., Dallas 6, Texas.

ELECTRIC SWING, plus basic diesel power, are outstanding elements of Type 111-M Marion Power Shovel Co.'s 4-cu. yd. machine. Independent of outside sources of power, this clutch-type shovel offers advantages of an electric swing unit.

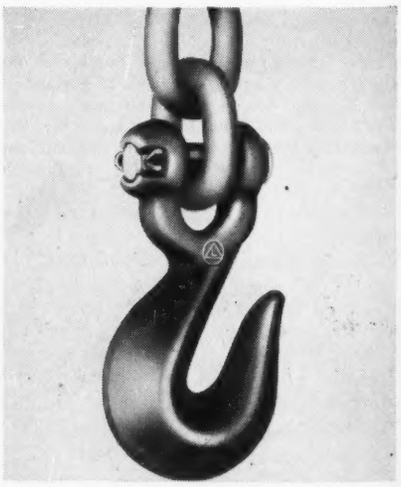
HYDRAULIC CONTROL has been added to the 10½-cu. ft. and to the 1¼-cu. yd. Payloaders made by Frank G. Hough Co., 801-U Sunnyside Ave., Libertyville, Ill. This control dumps and closes bucket, increasing ease and speed of operation.



CABLE-CONTROLLED equipment, including grader, dozer, scraper and ripper, has been designed by Bucyrus-Erie Co., South Milwaukee, Wis., for International's TD-24 crawler tractors. Full visibility and high capacity are two improvements cited.



FLATTENED SPHERES make better grinding balls than perfect spheres do, according to H. K. Porter Co., Inc., 1932 Oliver Building, Pittsburgh 22, Pa. Flat surfaces on these "Tuffalloy" ball mill grinding balls are said to increase contact area and grinding speed.



CLEVIS grab hook is easily attached to chain by slipping in clevis pin and spreading cotter. Thomas Laughlin Co., Portland 6, Me.

(*Continued on p.* 116)

Takes tons of trouble off your hands

Hewitt Conveyor Belting gives you longer, more dependable service at less cost

Once you see this belting in action, you'll understand why thousands of other wide-awake engineers specify Hewitt for all their belting needs.

You will find, as they have, that you can depend on Hewitt Conveyor Belting for your unusually severe operations. That's because it handles heavy abrasives, like ore and rock—or wet, gritty materials, such as fines and slag, with ease. In short, it is extremely strong belting—built to take tons of trouble off your hands.

You can get Hewitt Belting for all of your needs: Maltese Cross for the really tough jobs, Ajax for general service, and Conservo for lighter applications and portable conveyors. So, take a tip from others who have used Hewitt Belting to solve their conveying problems. You'll find it's the efficient, economical answer to your problems, too.

Just call the Hewitt distributor listed in the yellow pages of your local telephone directory. Or write direct to Hewitt Rubber Division, 240 Kensington Avenue, Buffalo 5, N.Y.

HEWITT

CONVEYOR BELTING

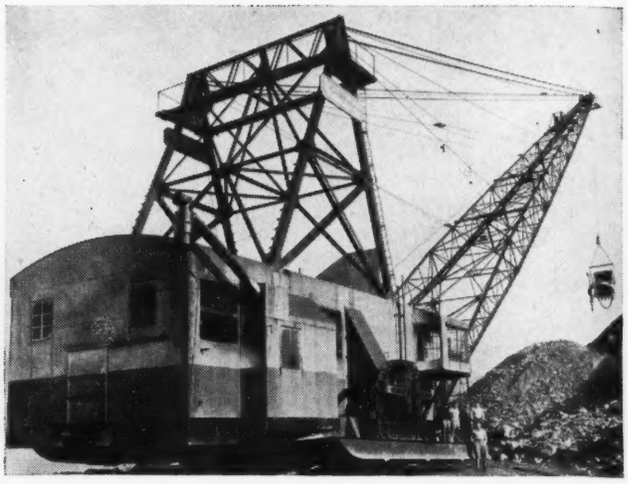
HEWITT RUBBER DIVISION
INDUSTRIAL HOSE • BELTING • PACKING

MORE REASONS WHY HEWITT BELTING PROVIDES LONGER SERVICE AT LESS COST

- Hewitt Belting is fully protected to resist moisture, oils, flexing, and ply-separation. It is also treated against mildew.
- Abrasion-resistant covers are made of extra-tough rubber. Rigid-edge construction prevents edges from curling if the belt becomes misaligned during conveying operations.
- Heavy textile reinforcement gives Hewitt Conveyor Belting unusual strength combined with high flexibility.
- You can get these leading types of belting to handle every kind of conveyor service: Maltese Cross for severe jobs, Ajax for general service, and Conservo for lighter applications and portable conveyors.

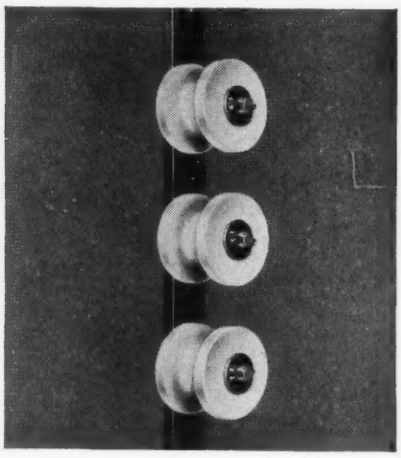
HEWITT-ROBINS HR HEWITT-ROBINS INCORPORATED **INCORPORATED**

SPOTLIGHT on its own field of view is provided by 4 or 7-power Flash-O-Lens, battery or a.c. operated. Made by E. W. Pike & Co., 492 North Ave., Elizabeth 3, N. J. Photo shows lens in use on flotation concentrate in Southwestern lead-zinc mill.

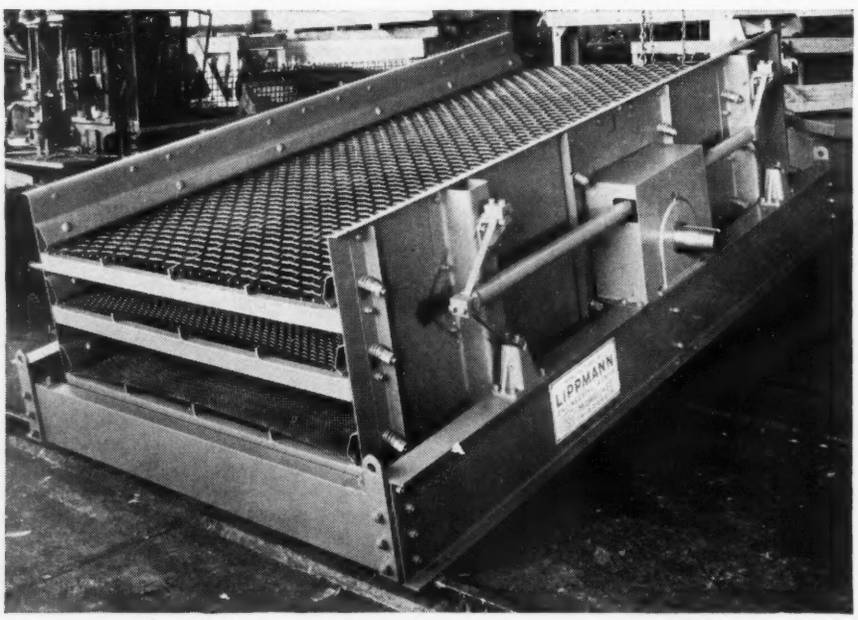


NEW RECORD of life for wire rope on dragline is reported by Jones & Laughlin Steel Corp. for its Precisionbilt wire rope on this 8-yd. machine. One J. & L. rope went 1,425 hours, against average of 382 hours for other brands used.

LOW-BED TRAILER, made by Alfred Stauffer Machine Shops, Honey Brook, Pa., makes possible easy loading of heavy equipment, like this bulldozer, for transport to shop or to field. Units carry 6 or 10 tons.



EASE in stringing cables results from use of this new feeder rack made by Ohio Brass Co., Mansfield, Ohio. It is made to hold three one-million cir. mil. cables hung vertically one above another. Threading is eliminated, but tie wires can be used.



PERFECT BALANCE of forces is said to feature this new eccentric-type screen made by Lippmann Engineering Works, Milwaukee 14, Wis. No vibration reaches the supporting structure, yet every part of the screen decks receives a perfectly circular vibrating motion.

INDUSTRIAL NOTES

D. A. Cheyette, vice-president of **Nordberg Manufacturing Co.,** Milwaukee, Wis., announced recently that **R. R. Schultz,** formerly assistant sales manager of the crusher and process machinery divisions of the company, had been promoted to sales manager.

Walter Geist, president of **Allis-Chalmers Mfg. Co.,** Milwaukee, Wis., was awarded an honorary degree of doctor of engineering on June 7 by the Michigan College of Mining and Technology, Houghton, Mich.

The Dorr Co., New York, N. Y., announces that **Charles K. McArthur** will represent the company in the states of Washington, Oregon and Idaho. His offices will be in the Lloyd Bldg., Seattle, Wash. **William E. Smith,** for the last seven years manager of Dorr's Canadian division, was

promoted on June 1 to the post of assistant manager of the company's North American sales division with headquarters in New York. He is succeeded in Canada by **Cyril Hewson Knight.**

George Deike, president, and his son, **George Deike, Jr.,** chief engineer, both of **Mine Safety Appliances Co.,** Pittsburgh, Pa., have been awarded Engineer of Mines graduate degrees by the Pennsylvania State College.

R. G. LeTourneau, Inc., Peoria, Ill., announces the appointment of **Harry R. Powers** as Eastern sales manager. **Danforth K. Heiple** has been promoted to chief field engineer for the company.

Gerald Bogner has been appointed engineer and representative for **Kennametal, Inc.,** Latrobe, Pa., manufacturers of cemented carbide tools. Mr. Bogner will work out of the New York office at 6 West Broadway. **Delmar Baker** holds a similar position in the company's Chicago office at 9 North Jefferson St.

John H. Matthews, vice-president and director of **Raybestos-Manhattan, Inc.,** was elected recently to the board of directors of the **Canadian Raybestos Co., Ltd.,** an operating unit of Raybestos-Manhattan, Inc.

BULLETINS

Ground Support. Methods of reducing accidents caused by fall of ground, as used in underground iron mines of the Lake Superior region, are described in a recent publication of the U. S. Bureau of Mines. For a free copy, write for Information Circular 7459 to the Publications Section, Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa.

Trolley Guards. A new folder on its Koroseal trolley guards, which will not burn and are resistant to acids, fumes, mildew and mine damp, has been prepared by B. F. Goodrich Co., Akron, Ohio.

Permanent Magnets. A concise 4-page illustrated booklet (No. CDM-16) devoted to G-E permanent magnet subassemblies for various purposes is available on application to General Electric Co.'s Metallurgy Division, Pittsfield, Mass.

Grinding Wheels. U. S. Rubber Co., Ft. Wayne, Ind., has published a 28-page catalog and price list covering high speed grinding wheels for use in foundries and metal fabricating plants. Address Mr. J. A. Fairfield.

Centrifugal Pumps. For the first time, a single comprehensive catalog has been issued covering the line of single-stage centrifugal pumps made by De Laval Steam Turbine Co., Trenton 2, N. J. Complete data for design and selection are given. Ask for Bulletin 83-29.

Storage Batteries. A large "exploded" view of the construction of a Gould "Thirty" storage battery features a new catalog on industrial truck batteries recently issued by Gould Storage Battery Corp., Trenton, N. J.

Diesel Engines. Hercules Motors Corp., Canton, Ohio, has prepared a detailed book on "Hercules Diesel Engines—General Information." The book reflects a broad knowledge of diesel engine design and operation, and a copy will be sent to anyone requesting it.

Steam Turbines. The Type "S" multi-stage steam turbines manufactured by Worthington Pump & Machinery Corp., Passaic, N. J., are described in a new bulletin just issued by the company.

Centrifugal Pumps: Worthington closed impeller, ball-bearing, single-stage centrifugal pumps for various types of drive are described in a new catalog of Worthington Pump & Machinery Corp., Passaic, N. J.

Carbide Drill Bits. Kennametal, Inc., Latrobe, Pa., announces publication of catalog RB-1 on its newly-developed line of chisel-pointed cemented carbide rock bits for pneumatic percussion rock drills. Six new sizes of bits are described.

Chemicals. An 18-page booklet describing the company's wide range of products in the fields of plastics, insulators, resins, metallurgical products and other compounds has been prepared by General Electric Co., Chemical Division, Pittsfield, Mass.

Silicones. A 30-page bulletin describing in detail the silicone products made by G-E is available on request to the General Electric Co.'s Chemical Division, Pittsfield, Mass.

Silver Babbitt. A new engineering brief on preparation and performance of silver babbitt, No. 397, is available from National Bearing Division of American Brake Shoe Co., 4930 Manchester Ave., St. Louis 10, Mo. The metal is said to be advantageous for uses requiring high bearing pressures or temperatures, such as in diesel engines, crushers, hoists or mill rolls.

Piston Packing. Cup-type packing for use in pressure-operated cylinders is described in a new folder issued by Worthington Pump & Machinery Corp., Harrison, N. J.

Electric Motors. Information on Allis-Chalmers electric motors of general purpose, suitable for all industry, is contained in a new "Handy Guide for Quick Selection of Electric Motors," available on request to Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Rubber Hose. The rubber hose, belts, and packing of various kinds, engineered especially for the oil industry, and made by U. S. Rubber Co., New York 20, N. Y., are described in a new bulletin just issued by the company.

Protective Equipment. A new 64-page catalog issued by Chicago Eye Shield Co., 2300 Warren Blvd., Chicago 12, Ill., lists the company's goggles, helmets, respirator, hoods and aprons, and also tells where and how to use them and maintain them.

Surveying Instruments. An informative, 4-page brochure, combining a catalog and calculating chart, has been prepared by C. L. Berger & Sons, 37 Williams St., Boston 19, Mass., to illustrate 12 types of Berger surveying instruments from an 18-in. Dumpy level to a plane table alidade.

Mine Cables. Nine types of Neoprene-jacketed cables for bringing power to mining equipment are described in Catalog 578 recently published by National Electric Products Co., Chamber of Commerce Bldg., Pittsburgh, Pa. A wide variety of cables and wires for other mining uses is also described.

Wheeled Tractors. Allis-Chalmers' new IB wheeled tractor is described in Bulletin No. MS-610, recently issued by the Tractor Division, Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. The flexibility and wide application of the unit are stressed.

Building Maintenance. Methods by which any handy man can take care of building maintenance are described in a new bulletin issued by Stonhard Co., Dept. EMJ, 500 Stonhard Bldg., 1306 Springe Garder St., Philadelphia 23, Pa.

Photomicrographs. The new Model L instrument for making photomicrographs, which the maker refers to as the very "last word" in this type of equipment, is described in a new catalog issued by Bausch & Lomb Optical Co., Rochester 2, N. Y.

Wire Rope. A new wall chart to guide selection of wire rope for use with various items of earthmoving equipment has been prepared by the wire rope sales division of R. G. Le Tourneau, Inc., Peoria, Ill. Address the advertising department.

Conveyors. A general catalog covering the handling of bulk materials in quantity, and picturing 12 units built for that purpose, is available from Robins Conveyors Division, Hewitt-Robins, Inc., Passaic, N. J.

Out of the RED WITH SLUSHER COSTS

NOW STREAMLINED SPECIALLY ENGINEERED BLOCKS AND BUCKETS

Cable costs run over a cent per ton for each ton of ore or rock handled. Do you use a foot of cable for every 5 to 10 ton of ore you handle? Figure it out!

• • •

THE ROPEMASTER

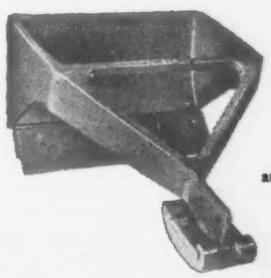
Properly balanced Ropemaster slusher blocks through proper design and balance follow the movement of your cable.

There's a Ropemaster for every job—try one and be convinced!

• • • • • • •

CATE SCRAPER

The one-piece scraper with smooth flowing lines. Finest electric furnace cast steel available.



These are low priced and positive tonnage movers!

Write for prices and details

Cate EQUIPMENT CO.
49 EAST 9th SOUTH
SALT LAKE CITY, UTAH

PERSONAL NEWS

PRESIDENT FREDERICK A. MIDDLEBUSH of the University of Missouri handing to Dr. Walter E. Remmers, president of the Electro Metallurgical Co., New York City, his diploma for the degree of Doctor of Engineering (honoris causa) awarded him at the 75th commencement of the School of Mines and Metallurgy of the University of Missouri at Rolla, Mo., on June 1. Dr. Remmers was graduated from the School of Mines in 1923. He delivered the commencement address there this year. Left to right are: Dr. Middlebush, Dr. Remmers, and Dr. Curtis L. Wilson, dean of the School of Mines.

George A. MacMillan and **Viola R. MacMillan,** widely known throughout Canadian mining circles for their direction of the Prospectors and Developers Association, are at present connected with the development of two mines in British Columbia, Slocan Rambler Mines (1947) and Violamac Mines (B.C.). The latter is a small gold-silver-lead-zinc producer in the Slocan district, with an established record for consistent and profitable operations.

Dr. Bert S. Butler, head of the University of Arizona's department of geology and mineralogy, retired July 1, but will continue to devote half his time to the university. **Dr. Maxwell N. Short** has succeeded him as department head.

John R. C. Mann, president of the Empire Star Mines Co., is now president of the recently formed Goldfield Columbus Mining Co., which has patented claims near Goldfield, Nev.

S. G. Sargis has been named supervisor of raw materials for the Geneva Steel Co., Geneva, Utah. Mr. Sargis was previously assistant superintendent of mines at Columbia, Utah.

C. R. King, associate metallurgical engineer, Division of Mines, San Francisco, Calif., has joined the staff of the Standard Perlite Co., with offices at 202 N. Euclid Ave., Pasadena, Calif. His new home address is 7652 E. Bolsa, R. 3, Santa Ana, Calif.

Langbourne M. Williams, Jr., president of the Freeport Sulphur Co. since 1933, has taken a leave of absence for an indefinite period so that he may assist Government officials in the administration of the Marshall Plan. He will act as director of the industry division in Europe for the Economic Cooperation Administration, with headquarters in Paris.

G. Carleton Jones, of New Consolidated Gold Fields of South Africa, has been awarded the gold medal, the British Institute of Mining and Metallurgy's highest award for distinguished services to the South African mining industry, particularly for the West Rand development.

C. A. Fredell has resigned as manager of the mining division for the E. J. Longyear Co. to accept a position as manager of Cia. Minera Venturosa, S. A., located at Namiquipa, Chihuahua, Mexico.

Theodore T. Brooks, mining engineer, is now in the mines division at the Copper Queen branch of the Phelps Dodge Corp., Bisbee, Ariz. He was previously on the staff of Quinton Engineers, Los Angeles, Calif.

James H. Morley, general superintendent of the American Rutile Corp. for more than 25 years, has been elected vice president and a director of that company.

R. McL. Johnson, who retired a year ago as general superintendent for the Inter-State Iron Co., on the Mesabi, has sold his home in Hibbing and gone to Coral Gables, Fla., to live.

P. George Maercky has been named a vice president of the Texas Gulf Sulphur Co. Mr. Maercky, a member of the AIME, has been active in the development of the Texas sulphur industry since 1913. Te has been associated with Texas Gulf since 1931.

A. H. Findeisen, mining engineer for the Wisconsin Industrial Commission, Madison, Wis., retired Aug. 1, after 29 years with the commission. **A. W. Usadell** is assistant mining engineer for the commission.

Robert K. Matheson, general superintendent for the Cordero Mining Co., McDermitt, Nev., has been granted leave of absence to supervise the diamond drilling program on the old Goleta property at Mono Lake, Calif., for Ira B. Joralemon and associates.

Dr. Samuel Goldich of the Texas Bureau of Economic Geology and the U. S. Geological Survey will become associate professor of petrography and petrology in the University of Minnesota's department of geology on Sept. 15. He will fill the position vacated by the retirement of **Dr. F. F. Grout.**

LaMont West, former assistant superintendent of the Jamestown mines for the General Chemical Division, Allied Chemical and Dye Corp., has been made superintendent of the Deming mines, Deming, N. M.

Dr. Hans Merensky, consulting mining engineer and geologist, received the Draper Memorial Medal for 1947, which is the Geological Society of South Africa's highest award for distinguished service.

Roland Durocher, mechanical engineer, is now with the iron ore research laboratory of the Jones & Laughlin Ore Co. at Negaunee, Mich. He was formerly associated with the Copper Range Co.

Russell Balconi, former mining captain of the Jones & Laughlin Ore Co.'s Vicar iron mine on the Gogebic range, has been made mine superintendent. He succeeds **R. G. Comer,** who resigned. Mr. Comer is now in business in Waukesha, Wis.

Dr. A. P. Fawley has been appointed a geologist on the staff of the Mines Branch, Department of Mines and Natural Resources, of Manitoba, Canada.

Charles W. Ritter, well-known Tri-State mine operator, has succeeded **Harry C. Packer** as director of the Tri-State mineral museum in Schifferdecker Park.

Richard Brewer, Iron River, Mich. mining engineer with Pickands, Mather & Co., on the Menominee range, has been made assistant chief engineer; **Ernest Couch,** Stambaugh, has been promoted from shift boss to assistant captain of the James mine at Mineral Hills; **Arthur Martini,** Caspian, from assistant captain at the Buck mine to captain of the Zimmerman mine, and **Andrew Hendrickson** of the Copper Country, to underground captain of shaft sinking operations.

PLEASE NOTE

A position is open on the editorial staff of Engineering and Mining Journal. We are looking for a young man with technical training in the fields of mining, milling, or non-ferrous smelting, preferably the latter. This man must also have about five years' practical experience in his field. He should be able to write an intelligible report, and if his hobby is photography, so much the better. Interested persons, please write to the editor, Engineering and Mining Journal, 330 West 42nd St., New York, 18, N. Y., giving personal data, education, experience record, and present salary level.

Evan F. Wilson, Akron, Ohio, has been appointed assistant director of the Division of Raw Materials, U. S. Atomic Energy Commission. Mr. Wilson will direct the division's research program, which is concerned principally with the development of methods of extracting uranium from low grade domestic sources. He will make his headquarters at the commission's New York office, 70 Columbus Avenue, New York City. Before his appointment with the AEC, Mr. Wilson was chief metallurgist for the Babcock and Wilcox Co. in Barberton, Ohio.

Dr. J. M. Parker of the geology department, North Carolina State College, Raleigh; **L. J. Culp** of Columbia University, New York; **Donald Brobst** of the University of Minnesota, Minneapolis; and **J. A. Redden** of Dartmouth College, Hanover, N. H., are making their headquarters at the new office of the U. S. Geological Survey at Spruce Pine, N. C. The Survey is resuming its regular mapping operations in the area, which were suspended during the war.

Dan M. Kentro, has rejoined the Shenandoah-Dives Mines Co., Silverton, Colo., as manager. As metallurgist with the company from 1936-43, he devised excellent selective flotation methods. For the past five years he has been with the American Cyanamid Co. at Stamford and Butte. **Charles A. Chase,** general manager since the operation's inception, will continue at Silverton as executive vice president.

C. A. Sargent, manager of the Northwest Magnesite Co.'s plant at Chewelah, Wash., has been promoted to general manager of the company and has gone to Pittsburgh, Pa., to assume his new work. He succeeds **Earl Garber,** who has been elected president of the Harbison-Walker Refractories Co., which controls the Northwest Magnesite Co. Mr. Garber was formerly at the Chewelah plant. **Howard A. Ziebell** has been made general manager there.

(*Continued on page* 120)

NORTH • EAST • SOUTH • WEST • IT'S SCHRAMM!

CHOOSE *as others have* **THE MODEL THAT BEST FITS YOUR NEEDS!**

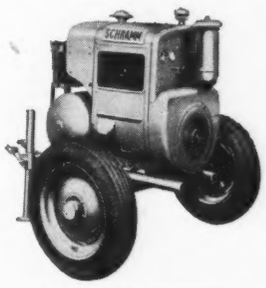
There's a Schramm Air Compressor, size and model, to meet your specific needs!

Below are listed s i x of the many Schramm models, portables ranging from 20 to 420 cu. ft. of actual air, the stationary ranging from 2 to 600 cu. ft. displacement.

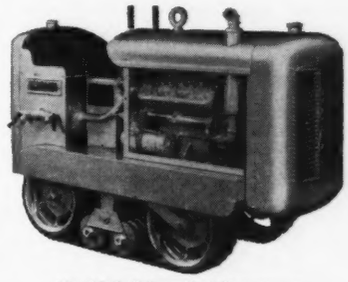
On all models performance records are evidence of their high quality. You will find the name Schramm written on every important page in compressor history.

Features you get in Schramm are: 100% water cooled, assuring ideal performance summer and winter; mechanical intake valve, forced feed lubrication, and electric-starter starting. All Schramms are compact, lightweight, easy to operate.

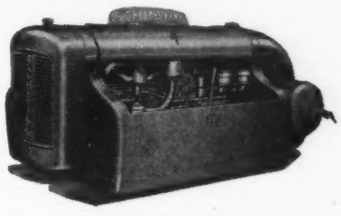
We invite you to write today for fully illustrated catalog describing in detail each of the Schramm Air Compressors shown here . . . plus a wide range of other models. We feel the Schramm story is a good one, and offers you a sure way to get your many compressed air jobs done quickly, efficiently, and economically.



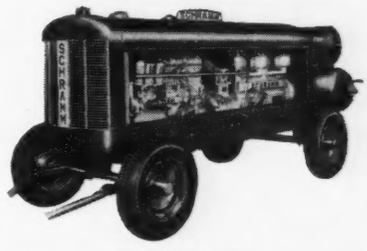
20/35 Model Compressor



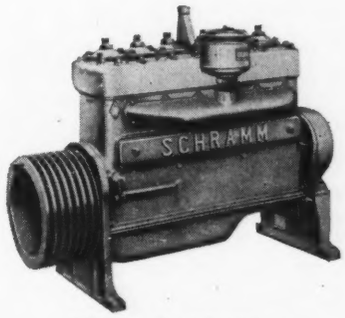
No. 60 Self-Propelled Compressor



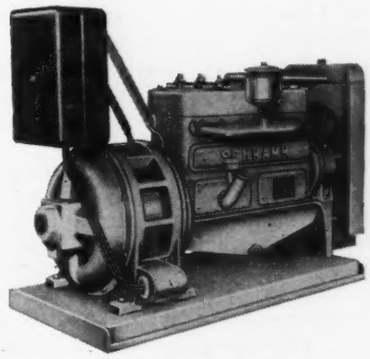
Skidded for Truck Mounting



Diesel Engine Drive



"V" Belt on Flat Pulley Drive



Built-in Motor Drive with Cooling Unit and Starter

SCHRAMM INC.

THE COMPRESSOR PEOPLE • WEST CHESTER • PENNSYLVANIA

PERSONAL NEWS *(Continued)*

A. Conrad Hawn, formerly with the Buffalo Ankerite Gold Mines, has accepted a position as mining and metallurgical engineer with the Canadian Carborundum Co. at Shawinigan Falls, Que.

Norman Sather of Wallace, Idaho, has succeeded **W. L. Zeigler** as superintendent of concentrators for the Hecla Mining Co.

Patrick Butler has announced his retirement as vice president and dirrector of Butler Brother's mining interests and its associated companies.

John G. Reilly, former managing director of the Cia. de Real del Monte y Pachuca, of Pachuca, Hidalgo, Mexico, is now with the U. S. Smelting, Refining and Mining Co. as assistant to the manager of Western mines of the company's Salt Lake City office.

S. J. Stromquist, safety director for the Cleveland Cliffs Iron Co., was elected chairman of the Lake Superior Section of the National Safety Council at the recent annual meeting in Duluth. He succeeds **J. P. Victor** of Ramsey, Mich.

Dennis Fairbairn has joined the engineering staff of the Reeves MacDonald Mines, British Columbia subsidiary of Pend Oreille Mines and Metals Co.

Ernest Oberbilling, who resigned as general superintendent of Bonanza Mines, Yellow Pine, Idaho, is living in Atlanta, Idaho, where he is engaged in antimony mining.

W. E. Rudolph is in Chuquicamata, Chile, where he is chief engineer for the Chile Exploration Co. He was formerly associated with the Dorr Co. as chief plant design engineer.

Mrs. W. J. Stratton is back in the mining business as vice president of Ninie Mines, with properties near Elliston, Mont. She was previously connected with the Stratton brokerage firm of Wallace, Idaho, which organized and promoted the mining enterprises known as the Dayrock, Silver Dollar and Silver Summit.

Roy E. Thomas, who was in Chile with the Chile Exploration Co., is now located in the New York office of the Anaconda Copper Mining Co.

C. B. Randall has been made the principal steel consultant to the Paris, France, headquarters of the Economic Cooperation Administration. Mr. Randall is vice president of the Inland Steel Co.

R. L. Burns, E. M. Gilmore, and **M. V. Van Delinder,** who recently graduated from the Montana School of Mines, are now on the staff of the Oliver Iron Mining Co. at Duluth, Minn.

Joseph T. Roy has succeeded **C. P. Chisholm** as superintendent of the American Smelting and Refining Co.'s East Helena plant. Mr. Chisholm retired June 30 after 35½ years' service with the company.

John E. Bowenkamp has returned to Colombia from Brazil, where he was engaged in a mine examination assignment for Wellington Explorations, Ltd., a subsidiary of the N. A. Timmins Corp. of Montreal, Can. For the present, he will remain in Colombia in connection with further mine examination work for that company.

A. Norman Into has been elected a vice president of the International Minerals & Chemical Corp. Since July of last year he has been serving as general manager of the company's potash division.

A. NORMAN INTO

A. D. Chisholm, general manager of mines for Pickands, Mather & Co., has announced the following promotions from the firm's Duluth office: **Kenneth Duncan,** general superintendent of the Hibbing district since 1942, has been appointed to succeed the late **L. C. David** as assistant manager in Duluth. Mr. Duncan, who has been with the organization for 28 years, has seen service on the Vermillion, Gogebic and Mesabi ranges during his association with the company. **Everett L. Joppa,** superintendent of the Scranton mine, will succeed Mr. Duncan as general superintendent of the Hibbing district. He came to Hibbing in 1946 from the position of superintendent of the Plymouth mine at Wakefield, Mich., which he assumed in 1942 after having been engineer on the Cayuna range and also at the Mahoning mine in Hibbing. **Maurice L. Bradt** has been appointed assistant to the general superintendent in the Hibbing district. He was chief engineer there for several years. Mr. Bradt previously had been located on the Monominee range of Michigan and had been engineer at the Mahoning mine. **William D. Webb,** superintendent of the Corsica mine at Elcor, succeeds Mr. Joppa as superintendent of the Scranton mine at Hibbing. Mr. Webb has been with the company for 24 years, during which time he has been engineer at the Mahoning mine at Hibbing, the Danube mine at Bovey, and superintendent of the Majorca at Calumet and the Corsica. **Hayden Sears,** engineer at the Bennett mine, Keewatin, is assigned to the Corsica mine at Elcor as superintendent, following Mr. Webb's transfer to the Scranton. **Seval C. Sorenson,** chief engineer of the Hibbing district, is being transferred to the Duluth engineering office. He was made assistant chief engineer in 1944 and chief engineer in 1947. **Edward L. Hermann** is appointed chief engineer of the Hibbing district in which he has been located since 1936. **Ray W. Sullivan,** engineer at the Mahoning mine, is appointed as assistant to Mr. Hermann.

E. R. Rudd has replaced **Dr. R. Lockhart Jack** as chief geologist of the Broken Hill Proprietary Co., Australia. **L. W. Parkin,** who resigned from the Department of Mines, Adelaide, is now senior geologist on the exploration staff of Broken Hill.

Thomas Jancic has been appointed superintendent of the Phelps Dodge Corp.'s Burro Mountain branch at Tyrone, N. M. He was formerly night foreman at the Cole shaft, Copper Queen branch, Bisbee, Ariz.

J. L. James, who superintended the Manhattan gold dredge at Manhattan, Nev., is now working in the same capacity for the Natomas Co., which operates the dredge in Copper Canyon.

A. M. Szynklewski is chief engineer with the Tungsten Mining Corp., Henderson, N. C. He was previously with the American Smelting & Refining Co. at Leadville, Colo.

Robert U. King, former resident geologist with the Climax Molybdenum Co., is on the staff of the U. S. Geological Survey, with headquarters at the Denver Federal Center.

Art Betchart, of the Sunshine Mining Co. at Kellogg, Idaho, has taken a position as chief engineer with the Pend Oreille Mines and Metals Co. at Metaline Falls, Wash.

OBITUARIES

William J. Reidy, district manager of the American Zinc Sales Co.'s Chicago office died suddenly on June 20. Mr. Reidy had been connected with the company for 29 years. He was first employed in the technical department at Hillsboro, Ill., and had been manager of the Chicago office since 1930. Mr. Reidy was 56 years old.

F. L. van Eyssen, 40, general manager of Grootvlei Proprietary Mines, Springs, South Africa, died in May. Before becoming general manager of Grootvlei, Mr. van Eyssen was underground manager at East Geduld, and general manager of Marievale Consolidated Mines and van Dyk Consolidated.

Arthur A. Dreyer, 36, mining engineer, who was mine foreman for the Pend Oreille Mines and Metals Co., passed away May 20 after a brief illness. Since his graduation from Washington State College in 1933 he had worked for the Standard Silver Lead Mining Co. in Montana and New

Mexico; Mt. Washington Mining Co. near Helena, Mont.; and as mining engineer for the Reconstruction Finance Corp.

George B. Dodge vice president of the American Rubber Manufacturing Co., Emeryville, Calif, died in San Francisco on June 24 at the age of 68. Mr. Dodge was a member of the AIME, and was well known in Western and Alaskan dredging circles.

Charles Y. Clayton, 57, professor of metallurgical engineering at the University of Missouri School of Mines and Metallurgy, died on June 27 after having been associated with the school since 1913.

Carl M. Mohr, 63, managing director of Ainsmore Consolidated Mines, Ainsworth, B. C., died June 25 at Nelson, B. C. Active in Slocan mining circles since 1911, he was associated with the Beasley copper development before World War I, and later was interested in the operations of Banker Mines, Ltd. During the past several years Mr. Mohr had directed the Ainsmore Consolidated's Kootenay Florence development.

Lorin N. Morrison, 93, pioneer Utah mining man, died May 28 at Ajo, Ariz. As a young man he assisted in the development of the Horn Silver mines and the San Francisco mining district in Utah and was well known for his work in the Bingham and Tintic areas. In the late 1890's he was instrumental in selling the Telegraph and Niagara mines to the U. S. Smelting, Refining & Mining Co. Mr. Morrison helped build up such mines as the King David, Cupric, Newhouse Copper, Blackbird Copper and Indian Queen.

Clarence W. Balke, for 30 years research director of the Fansteel Metallurgical Co., Chicago, died July 8. He was 68. A leader in metal and ore research, Dr. Balke developed tantalum which was extensively used during World War II by surgeons.

Andrew B. Stewart, mining engineer and operator, died June 2 in Silver City, New Mex. He was 77. With associates he developed the Houston-Thomas mine at Pinos Altos into a profitable producer.

Ralf R. Wooley, senior hydraulic engineer for the U. S. Geological Survey, died July 1 at his home in Salt Lake City. He was 63.

David Keith, Sr., 53, president and director of the Silver King Coalition Mines Co., died in Salt Lake City July 9.

Dr. Edward Payson Mathewson, retired mining engineer and metallurgist, died July 13 at Tucson, Ariz. He was inventor of improvements in blast and reverberatory furnaces for smelting copper and lead ores and for many years was consulting metallurgist for the American Smelting & Refining Co. He also held positions with Anaconda Copper Mining Co. and the International Smelting & Refining Co.

STEEL

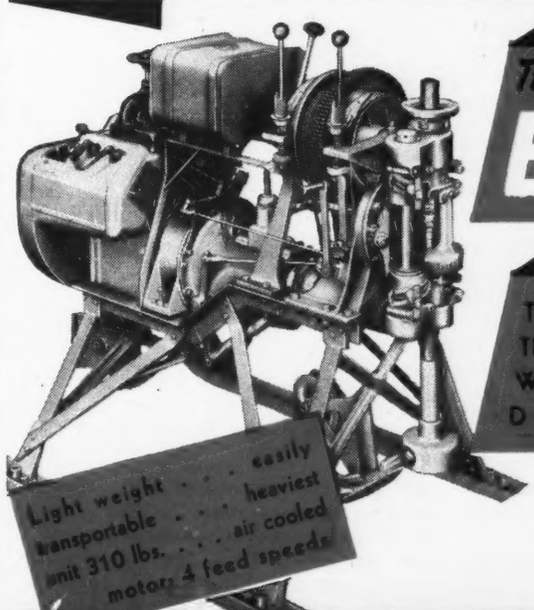
Every Kind
Quick Delivery

Plates, Structurals,
Bars, Sheets, Tubes, etc.
. . . Carbon, Alloy and
Stainless Steels . . . .

RYERSON

Joseph T. Ryerson & Son, Inc. Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco

WHEREVER THERE'S...
DIAMOND DRILLING



THERE YOU'LL FIND THE
BBS-1

THE WORLD'S MOST THOROUGHLY TESTED, WIDELY USED SURFACE DIAMOND DRILL.

Light weight . . . easily transportable . . . heaviest unit 310 lbs. . . . air cooled motor; 4 feed speeds

BOYLES BROS. DRILLING CO. LTD.
DIAMOND DRILLING CONTRACTORS AND MANUFACTURERS
VANCOUVER, B.C. - EDMONTON, ALTA. - PORT ARTHUR, ONT. - KIRKLAND LAKE, ONT. - YELLOWKNIFE, N.W.T.

REGIONAL NEWS

WASHINGTON

Sodium sulphate plant purchased by Industrial Enterprises—Talisman company reports lead-zinc find

★Wallace R. O'Keefe, with aliases listed as W. O. Kearns, M. C. Kelly, and W. A. O'Keefe, was indicted by a federal grand jury in Seattle, June 23, charged with carrying on fraudulent mining investment deals in the Northwest continually since 1941. He is reported to own mine properties in Idaho, Montana and Washington.

★The total value of ores produced in Pend Oreille County in 1947 amounted to $3,247,696, from 295,015 tons treated, bringing that county to first place in Washington, both in value of metal produced and in tonnage of ore treated, according to the U. S. Bureau of Mines. Chelan County ranked second in value with 232,322 tons valued at $1,626,492, while Stevens County's metals were valued at $1,251,190. In Pend Oreille County production came from Pend Oreille Mines & Metals Co.; American Zinc, Lead & Smelting Co. and Metaline Mining & Leasing Co.; in Chelan County, mainly from the Howe Sound Mining Co.; in Stevens County, chiefly from Admiral, Bonanza, Cleveland, Deep Creek and Young America mines.

★Value of the 5 metals, lead, zinc, silver, copper and gold, was $7,147,798 in 1947, in the State, compared with $6,886,748 in 1946, or a gain of less than 4%. Lead output was 79% above 1946, zinc 22%, and silver 11%, but copper dropped 52% and gold 32% below the 1946 figures. This drop was attributed to the closing of the 2,000-ton mill at Howe Sound's Holden mine, in the Cascades, in order to spend time and effort developing ore.

★Industrial Enterprises, Inc., Seattle, has purchased the sodium sulphate plant of Washington Chemical & Salt Co. at Monse. According to Homer F. Smith, president, the plant may be moved to the Omak-Okanogan district. It will be modernized and will produce a refined product for the detergent soap industry. About 20 men will be employed and initial production will be 50 tons of anhydrous sodium sulphate daily.

★Prof. Donald L. Masson, acting director of the Washington State College School of Mines, reported that the school had done extensive research on oxidized zinc and lead ores in the Metaline Falls mining district. He, together with 4 senior mining students, will spend the last 3 weeks of a 6-weeks tour in mining surveying at the Pend Oreille Mines & Metals Co., Metaline Falls.

★It was reported early in June that Sullivan Mining Co. had added a second diamond drilling rig to its crew doing exploratory drilling on the property of the Metaline & Pine Creek Cons. Co. in the Metaline area. According to H. S. Johnston, secretary-treasurer of the Metaline company, a number of deep holes have been put down.

★Talisman Mining & Leasing Co., operating the old Laurier mine above Laurier, is about to re-enter the producing class, according to the company's vice-president, Frank Luedke, who reports an unexpected ore discovery at the property with assays running over 20% lead, 11% zinc, and 2.4 oz. silver to the ton. The company has a 150-ton mill. Carl O. Anderson is president, Brooks Kimmel is secretary-treasurer, and other directors are Paul Kreusel and John J. Stalick.

★H. Louis Schermerhorn, Spokane, president of Metaline Mining & Leasing Co. at Metaline Falls, reported that development at the mine since it was closed last August consisted of sinking the 282 incline to the next lower level where development was necessary for production of a down dip extension of the orebody above. He also expressed satisfaction with several diamond drill holes which have been sunk. He reported one diamond drill operating one shift per day exploring new orebodies or extending known ones. A total of $262,348.66 was received for ore produced last year, with net profits at the end of the year being $16,112.46.

★Columbia Gypsum Products, Inc., was negotiating in June for the purchase of 100 acres in the Spokane Valley for the site of a gypsum crushing and bagging plant, according to J. S. Livingstone, an official of the company. He reported work is being done on a road to the gypsum deposits, near Lake Windermere, B. C. First shipments will be made to plants at Vancouver, B. C., and other Canadian points. The company hopes to start construction of the Spokane plant this summer.

★Washington produced 800 tons of lead in April, compared to 885 tons in March, and the 383-ton monthly average for 1947; 1,290 tons of zinc in April, compared to 1,475 tons in March, and the 1,136-ton monthly average for 1947 according to the United States Bureau of Mines.

★It was reported in June that the Grandview mine at Metaline Falls, operated by American Zinc, Lead & Smelting Co. was milling over 600 tons of ore daily, and working 6 days a week.

★Officials of Permanente Metals Co. reported this summer that more than 2,500 persons have visited the Trentwood and Mead plants at Spokane. The register includes persons from Canada, China, England, France, India, Italy and South America, most of whom were industrialists, scientists, engineers and teachers, getting first-hand information on American aluminum production.

CALIFORNIA

New power line will supply dredge of Reeves Ranch company—New Idria still in operation

★The Rowe, Gabelic and Buehler mining properties near Lavic, San Bernardino County, are now being worked independently following termination of a lease agreement with D. A. Kendall, of Los Angeles. In this area lie commercial deposits of celestite, strontianite, rhyolite, hemared ochre, flagstone, jasper and limestone. The Kendall operations were centered in mining celestite, the crude ore being trucked to the old Red Ball Mill at Barstow for processing. Equipment has been readied to renew production on the celestite deposits, and shipping of crude ore was scheduled to commence on July 15. Operations, as well as those on the adjoining Chatham claims, are supervised by Mr. C. Buehler, of Pasadena.

★A contract has been let to build a power line from Thompson Creek to Reeves Ranch in Siskiyou County, a distance of about 6½ miles, to supply electric power for the bucketline dredge now being assembled on the Klamath River near Happy Camp by the Reeves Ranch Dredging Co. The dredge is equipped with 68 4-cu. ft. buckets, can dig 23 ft. below water level, and is capable of handling some 3,000 cu. yd. a day. When in operation, the dredge will employ from 12 to 15 men under the direction of Harold C. Young, dredgemaster.

★Contrary to several press reports, the New Idria quicksilver mine in San Benito County is still in operation. The company has some commitments in contract form to fulfill, and as a consequence it is doubtful that operations will be suspended until another 2 or 3 months have passed. Current high cost of production and large volume of quicksilver imports from Europe have worked hardship

on the profitable operation of the mine for the past 3 years and may force the property, which has been the largest domestic producer of quicksilver for years and one of the few American mines still active, to shut down. Because of difficult underground conditions at New Idria and relatively long time required to resume operations, a shutdown now may have a serious effect on production of quicksilver in an emergency. The property is operated by the New Idria Quicksilver Mining Co., Gordon I. Gould, president, with C. Hyde Lewis, general superintendent, directing work at the mine and reduction plant.

★Lee Merrill and Glenn Gibbons are conducting hydraulic mining operations at the Hickox property near Somesbar, Siskiyou County, under lease to them from Luther Hickox.

FRANK J. LILLY, Spokane mining statistician, paid $25,420 late in May, instead of approximately $19,750 the U. S. Treasury would pay, for the gold in these 6 plastic containers. Instead of the $35 legal price, he paid $45 an oz. for gold in unrefined form and expects to profit by selling the gold later. The nugget in front of the scales is worth almost $600.

OREGON

National Lead subsidiary to produce non-ferrous alloys—Farmers file extensive damage suits

★Morris P. Kirk, Inc., a subsidiary of National Lead Co., plans immediate construction of a plant for production of non-ferrous metal alloys on a 9-acre tract which was recently purchased from the Bethlehem Steel Co., at Portland.

★Ninety-seven farmers have filed damage suits in federal court at Portland totaling $1,500,000 against the aluminum plants at Troutdale and Longview, Wash. According to Attorney James Dezendorf, they claim noxious fumes are destroying cattle, crops and orchards. E. J. Appel, an official of the Reynolds Metals Co., said his company has scientists working on the fluorine gases and that individual damage claims have been settled out of court. The plaintiffs ask a permanent injunction against continued operation of the plants, and treble damages under Oregon and Washington statutes involving international trespass damage. Others in the Washougal, Wash., district were expected to join in the suit.

★Some interesting comparisons in the State's gold mining in 1940-41 and 1948 were given in a report on "Oregon's Gold Placers" by the staff of the Ore.-Bin in the June issue. In 1940, 56 dredges, 82 hydraulic mines, 44 hand operated properties were operating compared to 5 producing dredges, 16 hydraulic operations when water was available, and a number of "snipers" working sporadically in early June of 1948. In 1941, 49 dredges operated in the northeast and southwest parts of the State, while in 1948, 5 dredges were operating in the northeast and 2 were preparing to operate in the southwest.

NEVADA

Dayton resumes milling at Silver City—Goldfield property developed by Newmont Mining Corp.

★Pumping water from the flooded 4-compartment 2,250-ft. Fad shaft of the Eureka Corporation, Ltd. on Ruby Hill began in mid-May when water stood at the 1,050-ft. point. Late in May the third level station, at 1,234 ft., had been unwatered, 5 heavy-duty station pumps were in place at this level and other electrically-driven pumps, including a 1,000-kw. and 2 800-kw. units, were lowered from the third level late in June. This process was to continue to the fifth or 2,250-ft. level, flooded when a long west crosscut released a heavy flow of water some 900 ft. from the shaft.

★Dayton Cons. Mines Co., a gold producer and custom milling enterprise in Nevada prior to Order L-208, is resuming operation of its 200-ton cyanide plant at Silver City in the Comstock district, it was stated by Homer L. Gibson, president and managing director. W. J. Henley of Virginia City is manager and a director, F. J. DeLongchamps of Reno is vice president and consulting engineer. Since closing down its mill, the company has reopened and reconditioned the 1,400-ft. New York shaft and main laterals, midway between Silver City and Gold Hill.

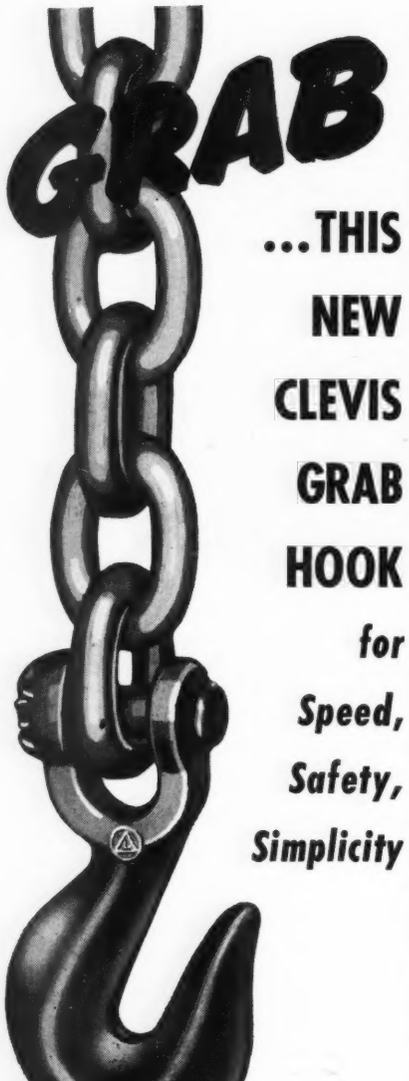
★In a statement issued at Goldfield, Fred Searls, Jr., president of Newmont Mining Corp., says that Newmont, "through arrangements with Goldfield Deep Mines Co., has been engaged in the development of the latter company's property at Goldfield, Nev., utilizing for the purpose funds supplied by Deep Mines company, derived from sale of its treasury stock to Newmont and other investors." A 100-ton mill is being built, as engineers employed by Newmont have estimated there is sufficient ore to defray this cost.

★Formerly productive silver-lead-zinc mines in the Broken Hills district in northern Mineral County are being reopened by the recently organized Broken Hills Mining & Milling Co., which plans to construct a 50-ton flotation mill soon, and to accept custom ore.

★A surface deposit of copper ore that produced some smelter shipments in the late '20's, situated in central Churchill County, is being developed and partly stripped with heavy-duty equipment by the Ajax Cons. Mines Corp., under direction of H. G. Walker, engineer and metallurgist long active in Nevada mining. The company also has secured under option scheelite, lead-silver and perlite deposits in northern Nevada. With further stripping of the copper area extended churn drilling is to be undertaken. E. J. Bottomley of Lovelock is in charge at the copper operation.

★Bulk samples of galena with high silver content, assaying up to $150 per ton, have been brought to Reno from a massive outcrop on the Toiyabe range, at the head of Ophir canyon in northwest Nye County, by R. L. Douglass, U. S. Internal Revenue Collector for Nevada, Charles Pefley and George Dallimore, veteran mine operators of Reno, who acquired the property last year. Contracts for development work have been awarded.

★Sale for delinquent taxes of mining claims and the old Kane or War Eagle 75-ton cyanide mill at Manhattan to



...THIS NEW CLEVIS GRAB HOOK *for Speed, Safety, Simplicity*

Here's a new one—a rugged, heat-treated, forged hook with a jaw that's quickly attached to any chain.

Slip the pin through the clevis; Spread the cotter

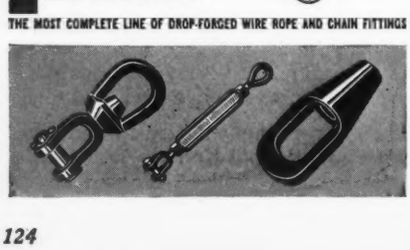
. . . and you've made a better, stronger connection in nothing flat. Supersafe, too—forged housing protects workers from projecting cotter pin.

Laughlin Clevis Grab Hooks do away with shackling . . . cold-shutting . . . cutting, bending and rewelding the chain. Easily changed from job to job.

Send for information . . . and Laughlin's data book of industrial fittings — Catalog #140. THE THOMAS LAUGHLIN COMPANY, DEPT. 5, PORTLAND 6, MAINE.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



Nevada *(Continued)*

Mark G. Bradshaw, Tonopah mine operator; has been confirmed by the Nye County district court. Bradshaw, who left by plane lately for New York and Washington, has planned early construction of a mill on gold property he controls at Diamondfield, in the northern part of the Goldfield district.

★Prospects that one of the leading Nevada mining companies will purchase and reopen the long-idle Gold Bar mine in the Bullfrog area, southern Nye County, were reported at Tonopah. The mine produced high-grade gold ore to a depth of 350 ft. in the boom period and a large surface deposit sampling $5 or more per ton has been developed.

ARIZONA

Regular ore shipments from open-pit section of Inspiration—$15 million increase in valuation of mines

★The Arizona State Tax Commission on June 25 increased the overall assessed valuation of Arizona producing mines for 1948 by approximately $15 million, bringing the total to more than $181 million. Tax officials stated that the figures were estimates and subject to review by a board of tax equalization which was to meet the first week in August.

The Phelps Dodge Corp. was hardest hit by the commission's ruling, with its Morenci branch properties raised $6,887,926; New Cornelia, $3,614,355; United Verde, $325,316 and Copper Queen, $83,085. Castle Dome and Christmas Copper Co. properties, whose 1947 valuations were $3,491,744 and $69,165, respectively, were not included in the June valuation because county assessors had not sent in complete reports on their assessment against these properties.

New valuations placed upon other producing mines, with last year's assessment shown in parenthesis:

Coronado Copper Co., $110,106 ($108,905); Phelps Dodge Copper Queen Branch, $19,762,389 ($19,679,304); Arizona Chrysotile Asbestos Co., $28,200 (unchanged); Inspiration Copper Co., $16,728,456 ($14,426,956); Miami Copper Co., $8,769,482 ($8,681,943); Phelps Dodge Morenci Branch, $66,471,735 ($59,583,819); Tennessee Schuykill Corp., $96,500 ($66,500); Eagle-Picher Mine (Empire Zinc Co.) $634,570 ($493,500); Phelps Dodge New Cornelia Branch, $38,471,900 ($34,857,545); Kennecott Copper Co., $12,963,780 ($12,463,780); Magma Copper Co., $6,664,198 ($5,521,237); St. Anthony Mining and Development Co., $492,957 ($482,957); American Smelting & Refining Co., $221,165 ($206,555); Bagdad Copper Co., $1,534,170 ($1,298,750); Phelps Dodge, United Verde branch, $3,739,087 ($3,413,771); Shattuck-Denn Iron King group, $1,974,820 ($1,641,015).

★At a recent meeting of the board of governors of the Arizona Department of Mineral Resources, it was suggested that the department take a more aggressive attitude toward Arizona mine promotions. Further cooperation with the Arizona Corporation Commission was planned so that a thorough examination and report by the resource department may be required before a stock selling permit is granted. The board of governors indicated that such an arrangement would save many dollars for Arizona investors by diverting investment funds to sound mining propositions with greater development possibilities.

★Many Arizona mining men have voiced disapproval of the recent bill permitting persons to maintain their mining claims for a year without doing the $100 worth of improvement work required under the law, because it is felt the new bill will slow down development work.

★William Ward of Maricopa County has filed a lien for $10,887.84 against Southwest Mines, Inc., located near Courtland, for labor and materials expended by Ward during the past year and a half. It brings to more than $23,000 the laborers and material liens against the mining firm of which Constantino Vincent Riccardi was the promoter.

★The first test hole for sulphide ore is now being drilled to the 2,400-ft. level on the Santa Maria claims in the Tiger-Mammoth district, according to John W. Daily, president of the San Pedro Mines Co.

★Developing of the San Manuel copper ore deposit, described by the U. S. Geological Survey as the second largest low-grade copper reserve in the country, is progressing on schedule, according to W. P. Goss, general-manager of the San Manuel Copper Corp. Three gas diesel engines for the powerhouse have been set on their foundations and the first unit was expected to be in operation by the end of July. The No. 1 shaft has been sunk 72 ft. and concreting of the top 50 began early in July, with erection of the sinking hoist and headframe to start soon.

★Inspiration Cons. Mining Co., Inspiration, has started regular ore shipments from the open-pit section. Two electrically operated shovels of 4-cu. yd. capacity and one diesel unit of 2½-cu.-yd. capacity are used in stripping and mining. Ore is dumped from the trucks into the newly constructed coarse crushing plant, a 42-in. gyratory type crusher, to be reduced to a maximum of 8 in. and conveyed to a new storage bin for delivery to the main coarse crushing

plant. At this point ore from the open pit joins that mined underground and after further crushing is passed to the leaching plant for treatment.

UTAH

Garfield Chemical to produce 500 tons sulphuric acid daily—Drainage Tunnel for Alta, Park City districts

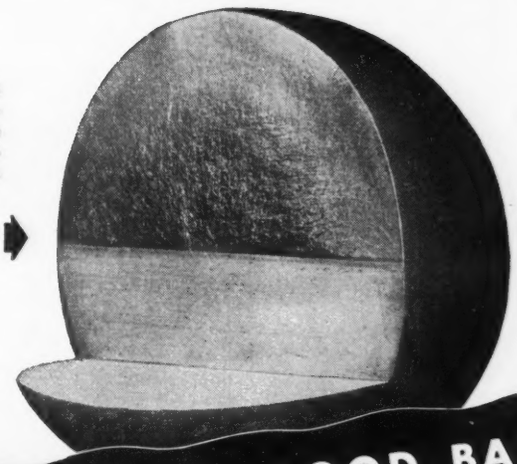
★An additional rich ore zone potentially valued at $376 million would be opened for development in the Alta and Park City mining districts by a proposed joint drainage and water development tunnel as part of the Central Utah reclamation and power development program now in formative stages. A 21-mile Y-shaped tunnel is proposed for diversion of Colorado River basin water into Salt Lake valley, drainage of the Alta and Park City mining areas and possibly for transportation of ore.

Economic barriers in the past were such that the entire cost would have to be assessed against mine operators and the project would disturb existing water rights, since drainage water from the mines area is usable for agricultural and domestic purposes.

By considering the tunnel to be a multiple-purpose project the water rights situation may be solved easily and economic feasibility enhanced. The mining phase is being studied by Paul T. Allsman, chief of the mining division, Bureau of Mines, and M. E. Vollin, assistant chief. Their findings will be turned over to the Reclamation Bureau for inclusion in the Bonneville Basin report which is in process of preparation.

★U. S. Smelting, Refining & Mining Co. has completed a 2-year improvement and modernization program costing well over $500,000 at its Midvale plant, F. S. Mulock, vice president and general manager of western operations, announced. In the new steam heating and compressor building the boilers are fired automatically and even the ashes that are pulled out of the grates to the floor are sucked into a pipe and pulled up to a large tile bin outside the building from which they may be hauled away in tram cars or trucks. The program included replacement of 3 old flotation units in the mill with individual modern V-belt drive units and new electrical switch gear, a new roaster baghouse fan, an automatically regulated pumping plant, and a new power distribution system and substation.

★Hercules Powder Co. has decided not to add two plant facilities to its property at Bacchus because of a shortage of natural gas and higher production costs here. Instead, it will locate its recently purchased war sur-



IT TAKES A GOOD BALL TO CUT GRINDING COSTS

TRADEMARK REG.

MOLY-COP

COPPER-MOLYBDENUM-ALLOY

Grinding Balls

ALLOY STEEL — FORGED — HEAT TREATED

Grinding costs are an all-important profit factor—particularly when you work low-grade ore. And that's where good grinding balls like Moly-Cop make the difference.

MOLY-COP Balls give you these five proved advantages:

1. **Your grinding media costs less per ton of production.**
2. **Your mill liner wear and replacement cost is lower.**
3. **You use less power per ton of ore.**
4. **You get a finer grind because Moly-Cop Balls wear evenly and retain their spherical shape.**
5. **Your handling and freight costs are lower because fewer charges are needed.**

Moly-Cop Balls have demonstrated their ability to lower costs in mills in the United States and in the larger mining countries of the world. Remember—it takes a *good* ball to cut grinding costs, and Moly-Cop is a good ball.

SHEFFIELD STEEL CORPORATION

KANSAS CITY, MISSOURI

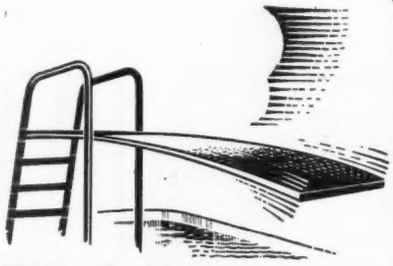
Export Representatives:

Ellsworth Wood, Post Office Box 1305, St. John, N. B., Canada

All Other Countries:

ARMCO INTERNATIONAL CORPORATION

Middletown, Ohio



Molybdenum for "resilience"

The outstanding contribution of Molybdenum additions to the properties of cast iron is the notable combined increase in strength and toughness. An accepted measure of toughness is that area under a transverse strength-deflection curve (often called "resilience").

Resistance to impact is a feature of great interest to the engineering designer; this much-sought quality is within the power of every gray iron foundry to impart to cast iron merely by ladle additions.

A typical test shows that the addition of 0.35% Mo to a good base iron increased the resilience from 340 in. lb. to 575 in. lb., an increase of 69% in this important property.

This is one of the well-authenticated facts concerning the properties of Molybdenum cast iron, details of which will be furnished on request.

Authoritative engineering data on Molybdenum cast iron and its applications are furnished by Climax Molybdenum Company.

Climax Molybdenum Company
500 Fifth Avenue · New York City

MOLY

® F2.

Utah (*Continued*)

plus nitric acid plant in the San Francisco bay area.

★Garfield Chemical Co., affiliate of American Smelting & Refining Co., has revised upward its plans for expansion, now expected to cost nearly $7 million. William J. O'Connor, president, announced the company will build a plant, to be completed in about 2 years, which will produce 500 tons of sulphuric acid daily instead of 300 tons planned in December, 1947; present facilities produce 200 tons of acid daily.

Several large chemical concerns and a fertilizer company have shown interest in obtaining acid from the plant. A new beet sugar refining process also calls for large quantities of the acid. An anode plant will be built to treat copper bullion for the Garfield refinery of Kennecott Copper Corp.

★The General Connor Mining Co., named in honor of the early commander of Fort Douglas who is looked upon as the founder of non-ferrous metal mining in Utah, has been formed by New Park Mining Co. and the Newmont Exploration Co. for developing 14 acres in the Park City district, each company subscribing $50,000 in equal amounts of stock.

IDAHO

Mill to be erected at Livingston mine —Lucky Friday Silver-Lead ships to East Helena smelter

★Sunshine Consolidated Mining Co., working on the western extension of the Yankee Girl vein on the 3100 level, has developed a mineable sized ore body for a distance of over 1,000 ft., which averages around 30 oz. of silver per ton for the millfeed product. The company is now starting stope mining.

★The Bunker Hill & Sullivan Mining Co. is constructing a miner's family home project at an expense of $350,000. Sunshine Mining Co. is also engaged in a new housing project. Both companies expect large additions to their present working force.

★Lucky Friday Silver-Lead Mining Co. has received net smelter returns of $170,876.50 from two shipments of concentrates sent to the East Helena smelter and the Sullivan zinc plant. The shipments represented about 6 cars of silver-lead concentrates averaging around 56% lead and 157 oz. of silver per ton, while the zinc concentrates averaged close to 60% zinc. These are the first ore shipments made since the shaft was completed to the 1400 level, where the company now has a proven ore shoot about 450 ft. long. The shipments consisted of ore produced in raise work back to the 1000 level and preparing stopes for mining the orebody. This work has been producing around 50 tons per day. The company has recently signed a new 3-year contract with the A.S.&R. smelter at East Helena which provides for a higher price payment for the lead content in the ore, conforming with the higher metal price and made retroactive to include the last two shipments.

★Sunset Minerals Co. in the Pine Creek area reports net smelter returns of $290,655 and Government premiums of $118,126, totaling a gross income of $408,981 for the year 1947. Net income was given as $31,394. Bliss Moore, former president of the Northwest Mining Association, who recently became manager of the property, states that recent exploration work above the 800 level has exposed a vein of good grade zinc-lead ore. Production of the mine for the month of March is reported at $35,000.

★The old Livingston mine in Custer County, a large early-day producer, is being reopened by a Seattle group including Carl A. Olson, W. C. Maring, R. Bennett, H. C. Petrie and J. J. McGreevy. Plans of the new company include the erection of a 200-ton milling plant to treat the ore left in the old workings and sinking of the shaft to deeper levels. T. S. Mackay is manager of the Livingston operation.

★According to its 1947 annual report the Bunker Hill & Sullivan Mining Co. produced at its Kellogg smelter seven different kinds of metal—silver, lead, zinc, antimony, copper, cadmium and gold. Some of the rare metals came from custom ores.

★The Caledonia Silver-Lead Mining Co., of Kellogg, is pumping out the old 500-ft. shaft of the North Bunker Hill property preparatory to driving a crosscut to pick up the strike of the old Caledonia vein east of a fault that terminated the vein in the Caledonia mine.

★Apache Mining Co. has started mining operations near Hailey, Idaho, on a group of 20 mining properties which the company holds under favorable option and lease agreements, according to Frank R. Plughoff, engineer for the company.

Two milling plants will be moved into the territory, and the first mill is expected to be in operation this summer with a daily capacity of 150 tons. In the beginning operations will deal mainly with working the old dumps, tailings piles and ore in the backfills and old stopes. According to H. P. Payne, general manager, the mines controlled by the Apache company, chosen by mining engineers out of a group of 126 properties examined, are the Bullion, Jay Gould, Mayflower, Ophir, Red Elephant, Eureka, Idahoan, Whale, Bay State, Garfield, King of the Hills, Valley

View, Ada, Ellen Stitts, Hoosier, Alturas, Point Lookout, O.K. mine, Rough and Ready and Mountain View.

MONTANA

Large tonnage of limestone blasted at East Helena plant—National Safety Council meeting in Butte

★Carbonate Mines, Inc., operating in the Marysville district, Lewis & Clark County, has made arrangements to use the 600-ft. level of the Bald Butte property, to reach the orebody, according to W. Randolph Green, Spokane, consulting engineer for the Carbonate company.

★R. C. Sherman, Butte, of the E. I. duPont de Nemours & Co., and Edward P. Maronick, operating the lime quarry of the East Helena plant of the A. S. & R. Co., in the latter part of June blasted about 100,000 tons of limestone by the use of 33,000 pounds of nitramon powder. The shot produced enough limestone to supply the smelter for a year.

★The first annual convention of the Montana Mining Section of the National Safety Council will take place at the Finlen Hotel, Butte, August 21 and 22, according to advices received from Walter H. Myers, Virginia City, president; R. B. Shelledy, Garrison, vice president, and Oscar A. Dingman, Butte, secretary. The meeting will consist of 4 business sessions, a luncheon, cocktail party and banquet; the program having been prepared by John L. Boardman, Butte, chairman of the program committee, and A. E. Haeseler, Mike Horse, and R. J. Armstrong, Garrison, members of the committee. The luncheon will be held at noon Saturday, and the cocktail party and floor show on Saturday evening. Attendants will have their choice of seeing a first aid exhibition or taking a trip underground after the Saturday luncheon.

COLORADO

Cresson production doubled with resumption of Midland Terminal—Bureau of Mines reports on shale oil

★The Atomic Energy Commission is making a survey of the recently purchased ore treatment plant at Durango to determine what improvements are needed to increase the efficiency of the plant in processing ore to recover vanadium and uranium. An ore purchase depot was to be established at Durango in July or August.

★The Donderberg-Terrible-Mendota mines of Silver Plume are being operated by Gold Mines Cons., Inc., of

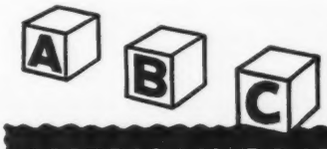
SAFE!

AND SAVING

VINYL Plastic Coated Mine Vent Tubing

Now Packed in Fibre Drums

Top protection for mines and miners . . . here's the ventilation tubing that WON'T BURN! ! ! Jute or duck fabric, coated and impregnated with special vinyl plastic compound, is flameproof to completely eliminate a fire hazard. Super-tough, too, to resist all common causes of tubing failure and assure a continued supply of fresh air where it's needed. Saves money because it lasts longer, won't mildew, fights chemical action, weighs less for easier installation and lower shipping costs. Now shipped in Stapak fibre drums for protection, easier storage, convenient underground handling. Send for Bulletin 107 and ask for free samples.

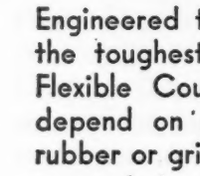


Made by the manufacturer of famous ABC Brattice Cloth in various grades.

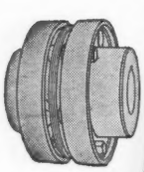
AMERICAN BRATTICE CLOTH CORP. WARSAW, INDIANA

THOMAS
Flexible ALL METAL
COUPLINGS

Engineered to stand up on the toughest jobs, Thomas Flexible Couplings do not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.

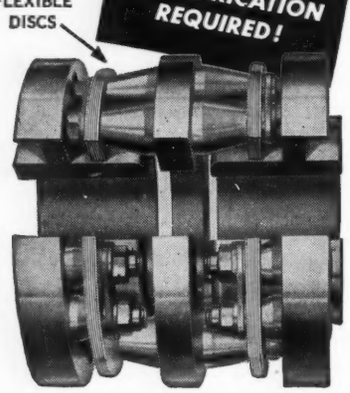


The standard line of Thomas Couplings meets practically all requirements. But if unusual conditions exist we are equipped to engineer and build special couplings.



BACKLASH
FRICTION
WEAR and
CROSS-PULL
are eliminated
NO LUBRICATION
REQUIRED!

PATENTED
FLEXIBLE
DISCS



THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT

Write for New Engineering Catalog

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

Colorado *(Continued)*

Denver, which holds these properties under long-term lease. After 3 years of rehabilitation work, production in May was approximately 250 tons of ore. June production was expected to be at least double this amount, and a goal of 1,000 tons has been set for July. It is anticipated that ore will average close to $40 per ton gross value with a content of silver, lead and zinc.

★Tony Anderson, county commissioner of Lawson, has opened up a 4-ft. streak of $30 silver ore in the Mohawk mine near Idaho Springs out in the Kitty Emmett group of claims. Bill Finnacle, working the adjacent Charter Oak mine, has nearly completed a 700-ft. crosscut to the Charter Oak vein.

★W. C. Schaus reports that the Central Mining & Development Corp. has leased the Independence mine on Dory hill in Gilpin County and will operate it immediately. The ore carries lead and silver.

★Since the Midland Terminal Railroad has resumed regular operation between the mines and the Golden Cycle mill in Colorado Springs, Cresson mine at Cripple Creek has doubled production, with an average of 5 cars of ore a day being shipped, according to Wesley Moulton, superintendent. A night shift has been put on at the mine. No shovel operated dumps are being shipped and a smaller railroad train can take care of all newly mined ore. The present trains can haul approximately 1,200 tons a day to the mill.

★The Dixie mine near Idaho Springs recently produced 15 oz. of gold from a few pounds of rock. A more recent find surpassed the first one. From the new find a museum piece has been taken, a rare specimen too valuable to be broken up for the gold it contains.

★The U. S. Bureau of Mines in Washington has announced that it has shipped its first bulk shipment of oil processed from Colorado shale at the demonstration plant near Rifle. The shipment included 6,369 gallons of crude shale oil which was sent to the Universal Oil Products laboratory at Riverside, Ill., where oil engineers will conduct exhaustive tests to separate the shale oil into grades of crude. The crude then will be sent to the Union Oil Co. laboratories in California for cracking and other refining studies.

★Mike Vinson and associates have completed construction of a 440-v. power line from the Pride of the West to the Lawrence tunnel near Silverton, and a compressor is being installed about 300 ft. underground.

★Laterals from the deep Portland shaft at Cripple Creek to drain the Cresson and the Vindicator mines are progressing, according to Mel Salsbury, superintendent of the Portland mine, who is in charge of the work. Driving of the laterals was started about March 1, and on June 20 the Cresson lateral had been driven 600 ft. and the Vindicator lateral 500 ft.

★On July 10 the Atomic Energy Commission announced withdrawal from entry, reserving for use of the AEC, approximately 115 square miles of public land in Mesa and San Miguel Counties, Colorado, and Grand County, Utah. During the summer the Commission, with the cooperation of the U. S. Geological Survey, will make a comprehensive study of these areas and test by diamond drilling for uranium bearing ores. Lands found to contain no uranium will be released from the withdrawal orders and will again be open for entry. It is expected that the lands found to contain uranium will become available for development and mining by private interests under arrangement with the Government.

WYOMING

★Robert M. Hawk, a jewelry manufacturer of Denver, has recently announced discovery of a jade deposit north of Lander estimated to have 50,000 tons of the mineral. The finest of the jade, which Hawk plans to use for objects of art, is worth up to $50 a pound. Lesser grades, worth $3 to $6 per pound, will be sold for building facades.

NEW MEXICO

Mex-Tex company building mill at San Antonio—Perlite deposits found in Socorro County

★The Deming Mining Co., Deming, operating since January the Denver and Little Bonanza mines in the Cuchillo-Negro mining district about 5 miles south of Winston, has maintained a steady shipping schedule by truck of lead, silver, copper and zinc ores into the El Paso smelting works of the A. S. & R. Co., 175 miles away. Operations are directed by Young E. Nichols.

★Richard McGhee, P. O. Box 74, Santa Fe, lessee of the Tom Payne mine located about 5 miles northwest of Cerrillos in the Cerrillos mining district, recently acquired some new equipment, including a crusher, rolls, Denver jig and Wilfley table which he is installing to treat some 4,000 tons of lead-zinc ore on the Tom Payne dump that averages about 5% lead, 12% zinc, and 1½ oz. in silver per ton.

★Extensive deposits of perlite, lying under considerable overburden except

on the fringes, have been found a few miles south of Magdalena in Socorro County. This non-metallic material exists in commercial quantities in several parts of New Mexico and promises to be of near-future industrial significance.

★A car of copper ore was shipped from the Manzano Gold Mines, owned by A. H. Gunnell of Albuquerque, to the El Paso smelter of A. S. & R., in June. The car was mined by two leasers who are developing the copper section of the property in an attempt to prove up possible large copper orebodies.

★The Shrine mine, a fluorspar property of the General Chemical Co., located 24 miles southwest of Silver City, was the scene of a surface fire on June 30. Fire destroyed the hoist house, headframe and some other surface installations with a loss of approximately $65,000. Five men who were thought trapped underground found their way to the surface by going through a connecting, abandoned shaft.

★The Mex-Tex Mining Co., with mines in the Hansonburg mining district of eastern Socorro County, are building a mill at San Antonio, N. M., on the Rio Grande River. The mill will treat combined lead, fluorspar and barite ores of the Mex-Tex and adjoining Royal Flush Mining Co. properties.

★News on July 2 that the Government proposes to increase the area withdrawn from public domain for bombing range and rocket testing grounds in Dona Ana, Socorro and Otero Counties, from 1,250,000 to 3,263,619 acres, gave rise to great concern in the State. Concerted opposition to this move by mining and ranching groups was scheduled for a hearing at Las Cruces on Aug. 2 conducted by the Department of Defense. Several mining properties were closed on this range when the Government took it over during the war and the area embraces considerable deposits and occurrences of copper, lead, zinc, iron, manganese and talc.

TEXAS

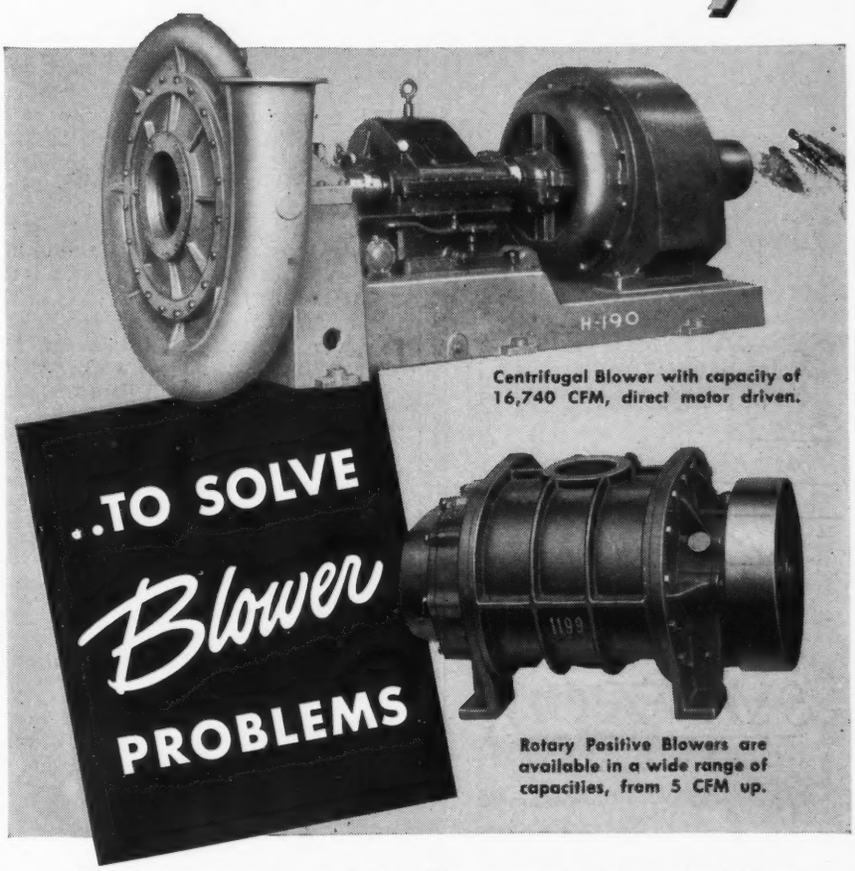
★The Texas Gulf Sulphur Co.'s new mine on the Moss Bluff dome in Liberty County, the fourth sulphur mine developed by the company since 1918, was put into operation recently, according to an announcement by H. E. Treichler, general manager. The mine went into production suddenly after 95 hours of steaming.

The new development is near the Trinity River, a short distance from the old townsite of Wallisville.

★A combined celebration of International Mining Days and the Regional Meeting of AIME will be held in El Paso, October 24, 25 and 26.

CALL ON

R-C dual-ability



Centrifugal Blower with capacity of 16,740 CFM, direct motor driven.

Rotary Positive Blowers are available in a wide range of capacities, from 5 CFM up.

That's important—our *dual-ability* to supply either Centrifugal or Rotary Positive Blowers. It means that our recommendations are always unbiased. We suggest the equipment that experience has proved will best meet the specific conditions.

In mining and smelting, many factors influence this decision. Capacities, pressures, drives, dimensions, weight and other characteristics are carefully considered. First cost, operating economy and deliveries are important points.

Our wide experience enables us to make sound recommendations. The accuracy of our engineering and sturdiness of our blower construction have been proved for many years.

For practical, up-to-date answers to your blower problems, you can depend on R-C *dual-ability*.

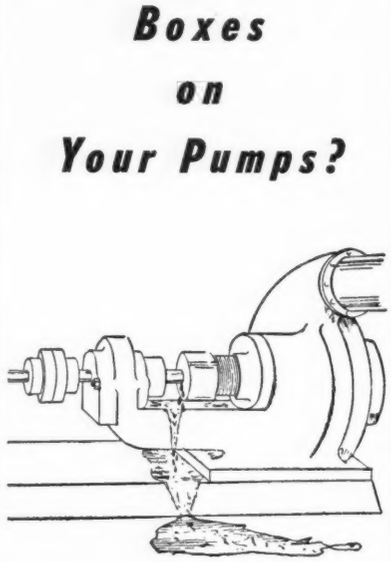
The first Rotary Positive Blower built by anyone was produced in the "Roots" plant in 1854—six years before the first pony express. We're not good because we're old, we're old because we're good!

ROOTS-CONNERSVILLE BLOWER CORPORATION
808 Washington Avenue, Connersville, Ind.

ROOTS-CONNERSVILLE ROTARY CENTRIFUGAL
BLOWER BUILDERS R-C SINCE 1854
BLOWERS · EXHAUSTERS · BOOSTERS · LIQUID AND VACUUM PUMPS · METERS · INERT GAS GENERATORS

★ ★ ONE OF THE DRESSER INDUSTRIES ★ ★

Troubled With Leaky Stuffing Boxes on Your Pumps?



Try

SYNTRON

"Replacement"

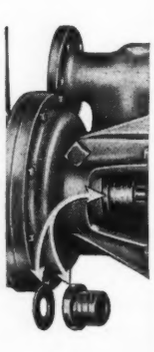
SHAFT SEALS

the next time!

Self-lubricating "Packaged" units (no conglomeration of parts to fuss with)—easy to install, just slide over shaft and secure.

For handling water, air, gases, petroleum products, etc.

Withstand temperatures from —10° F. to +200° F., and pressures to 250 psi.



Write for folder.

SYNTRON CO.

510 Lexington, Homer City, Pa.

IRON COUNTRY

Inland Steel lets contract for large ore carrier—Cliffs Power company to install new steam plant

★Shipments of iron ore from Lake Superior mines early in July had passed the 30 million-ton mark and were nearly 5 million tons ahead of 1947's corresponding date. Stocks of ore at furnaces on July 1 were 23,287,815 tons compared with 18,869,689 tons July 1, 1947.

★The Lake Superior Iron Ore Association reports June, 1948, shipments from upper Lake ports, in gross tons, as follows: U. S. ports, 11,548,830; Canadian, 178,537; grand total, 11,727,367. Cumulative totals for the season, to July 1, 1948, were: U. S. ports, 30,643,265; Canadian, 370,631; grand total, 31,013,896.

★The Great Northern Ry. Co. has ordered 12 new diesel electric locomotives for passenger and freight service, ranging from 1,500 to 6,000 hp. each.

★Butler Brothers has in operation a profit-sharing plan for employees at its Minnesota mines, reportedly the only such plan employed by Mesabi range mining companies.

★Butler Brothers have received 7 new 20-ton Euclid trucks of which 6 went to the South Agnew mine and one to the mines at Cooley. Two more for the Cooley group of mines are expected soon.

★Since May 10 Butler Brothers employees have been working on a 48-hour week schedule. Shipments to date are on schedule and all plants are working to capacity.

★The Inter-State Iron Co. has a schedule for the 1948 season of 3,698,000 tons from its Mesabi range mines.

★A new Quonset truck garage 60x80-ft. has been erected at the Inter-State Iron Co.'s Hill-Annex mine at Calumet, Minn.

★The Minnesota Executive Council and the Commissioner of Conservation of the State of Minnesota in St. Paul have issued 34 permits for iron ore prospecting on state owned mineral lands. Eighteen of the permits went to companies for which Pickands, Mather & Co. is the operating agent; 6 to Zontelli Brothers of Ironton, Minn.; one to the Hanna Coal & Ore Corp.; one to Rhude & Fryberger, Duluth; 6 to W. S. Moore Co. of Duluth and 2 to the Pacific Isle Mining Co., Hibbing.

★The Inland Steel Co. is developing a small open-pit mine at its Armour No. 2 property at Crosby on the Cuyuna range.

★The Cuyuna range, Minnesota's youngest, which in 1911 made the modest shipment of 147,649 tons, for the past 7 years has exceeded 2 million tons of ore shipped each year. Indications are that 1948 will surpass the 1943 record of 3,065,555 tons.

★In line with its policy of disposing of all property not required for mining operations, the Oliver Iron Mining Co. has offered 30 of its houses in the Coleraine-Marble district for sale. Present tenants of the houses will have the first opportunity to purchase and are given to September 1 to make their decisions.

★At Butler Brothers' South Agnew mine 211,310 cu. yd. of stripping were moved during May by the 120B. shovel and 97,665 cu. yd. by the 1150B. The big dragline is getting in step, however, and during June it handled about twice as much material as did the 120B, surpassing expectations for this early period of its operation.

★The Inter-State Iron Co. has taken mining options on ore lands in Section 25 and Section 30 at Ely, Minn., on the Vermillion range. A rather extensive program of diamond-drilling is planned for the near future.

★The Inland Steel Co. has let a contract for the construction of an ore boat which, it is reported, will be the largest and fastest on the Great Lakes. The ship will be 668 ft. overall length, 70 ft. wide with a summer draft of 25 ft. 6 in. It is designed to carry 20,000 gross tons at its intermediate draft of 24 ft. 6 in. and to have a speed of 16 m.p.h when fully loaded.

★The Jones & Laughlin Steel Corp. at its Aliquippa plant has installed 13 large hot metal cars of 200-ton capacity each, to replace the old 25-ton top ladle cars. It is expected that they will increase the iron producing capacity of the Aliquippa plant by 75,000 tons a year.

★The sections of poor highway between the Marquette iron range and the Copper Country are being slowly corrected by the Bacco Construction Co., which is paving 5.6 miles of U. S. 41 west of Nestoria, Mich. About 12 more miles need paving before the road is completed.

★The Lake Superior and Ishpeming Railroad, Marquette, Mich., has requested authority from the Interstate Commerce Commission to extend its line west of Ishpeming, Mich., to Republic, Mich., to serve an iron ore mine of the Cleveland Cliffs Iron Co.

★A new 7,500 kw. steam generation plant will be installed just east of Ishpeming, Mich., by the Cliffs Power and Light Co. and should begin operation by 1950, according to announcement made by Manager J. D. Preston. Last month the power company completed and started operating a 5,000-kw. diesel power plant, made up of 1,000-hp. diesel engines and generators from scrapped war vessels, secured through the War Assets Board. Due to shortage of rainfall

the hydroelectric plants of the Cliff company have very little water left in their storage basins, and the new diesel plant saved curtailment of operation at some of the iron ore mines.

★A research laboratory to cost over $200,000 is being erected by the Cleveland Cliffs Iron Co., at Ishpeming, Mich. Various forms of beneficiation for low grade iron ores will be tested in the new laboratory.

★At the Mather "B" mine, Negaunee, Mich., a contract was let to build an engine house of steel and brick, and part of the footings have been poured. The building is approximately 60x190 ft. and will contain the 2 hoists, 4 compressors and fly wheel sets, which will be served by a 35-ton traveling crane. Shaft sinking was down to 1,100 ft. on July 1. Slightly more water was encountered in the shaft but pumps were changed to take the increase.

WISCONSIN

★The Calumet Corp., subsidiary of Calumet and Hecla Cons. Copper Co., has been churn drilling for over a year in the southwestern Wisconsin zinc district. Several zinc orebodies, which appear to be of the same general nature as to tonnage and grade as numerous others mined in that district over many years, have been discovered just south of Shullsburg. The company plans to sink shafts on 2 of the orebodies in the immediate future, and if data obtained from the churn drilling are confirmed, and if the market continues favorable for zinc, a mill will be erected and mining will proceed, it was reported recently by a Calumet official. Drilling will then be carried on at a reduced rate. The work will continue under the direction of Harold Ewoldt, manager of the Calumet Corp.

MICHIGAN

Calumet & Hecla has largest employment in 10 years—Testing of Torch Lake tailings continues

★Employment at the Calumet division of the Calumet & Hecla Cons. Copper Co. exceeds the wartime peak established in 1944, when 2,248 were employed. After the close of the war employment decreased to 2,035 employees in January, 1945, but the number has risen gradually since that date to the present 2,424, the largest employee total in over 10 years.

★Thousands of tons of tailings, stamp sand dumped into Torch Lake, Houghton County by Calumet & Hecla, have been the subject of investigation for

Footage that counts

For speed, footage and high diamond salvage, choose the JKS HARDHED 55 Tungsten-Carbide Matrix Diamond Bit.

Choose HARDHED 55 Core Bits for drilling in broken, irregular or coarse-grained formations. The tough, powdered metal matrix resists the action of hard and abrasive cuttings. This free-cutting bit gives faster than normal drilling speed.

FEATURES OF HARDHED 55

1. Select quality diamonds
2. Extremely hard, tough matrix
3. Matrix gives maximum diamond support
4. Scientific diamond pattern
5. Careful diamond setting

Result:
Lowered drilling costs per foot.

Catalog on request.

J. K. SMIT & SONS
157 Chambers St., New York 7, N. Y. 129 Adelaide St., Toronto, Ont.

Cut the cost of Cotton Filter Cloths

—by making them Last Longer with

THŌRATEX
REG U S PAT OFF

- Frequently outlast untreated cloth 3 to 1
- Resistant to corrosive action of caustic and alkaline solutions.
- Mildew and rot resistant.
- Maintains filtering capacity.
- Smooth surface.
- Cakes come away easily.
- Reduce gumming.
- Fewer washings required
- More continuous press operation.
- Less shrinkage on press
- May be used in cold or boiling filtrations.
- May be used with hydrocarbon solvents.
- Better filtration.
- Soft, flexible—sews easily

FREE TRIAL

Send us, prepaid, a roll of your cloth for finishing. Try it under actual plant operations.

Information and samples on request

SPRINGDALE FINISHING SOUTH, INC.

Sales Offices:
320 Broadway, New York, N. Y.
Mill: Whitney, So. Carolina

Michigan (*Continued*)

some time to determine whether they have industrial value after the removal of the copper. The 2 types of tailings, conglomerate and amygdaloid, are in separate banks. Amygdaloid has been used locally for concrete. It is the hardness and red color of the conglomerate sands that may make them useful. Though no substantial market has been found, tests have been made for such purposes as grinding wheels, polishing compounds, enameling frits, and roofing granules. Samples, varying from small 5-pound lots up to a 50-ton carload, have been shipped to users.

★Nearly 4,000 ft. of 6-in. galvanized pipe is being recovered from various discontinued operations at Calumet & Hecla properties in the district, and will be used to pump water from No. 1 Kearsarge shaft to the Centennial shaft.

NEW YORK

★Shaft sinking has begun at the Clifton mine, Degrasse, according to Russell Fish, general manager of iron ore operations of M. A. Hanna Co. W. F. Shinners will be in charge of the mine, with F. W. Sutter as assistant.

★Jones and Laughlin Steel Corp.'s Benson mines at Star Lake produced approximately 2 million tons of crude ore in 1947, from which 650,000 tons of concentrates were produced. Tonnage is expected to increase to 1 million tons of concentrates in the near future, with eventual annual production of 2 million tons.

NORTH CAROLINA

★John Giles and C. W. Dunbar, formerly of St. Louis, Mich., have set up a mineral research laboratory at Waynesville, N. C., to explore production possibilities of several minerals found in the Waynesville area. Chief object of the research project will be olivene.

★Machinery of the Asheville Mica Co.'s plant at Biltmore, N. C., is being moved to Newport News, Va., where plants of the company are being consolidated. The Biltmore plant has been in operation since 1916 and many of its 300 to 400 employees are to move to Newport News, according to company officials. Properties of the company at Biltmore will not be sold, nor will they be converted immediately to other uses, officials said.

★Harris Clay Co., Spruce Pine, has just completed a shipment to Japan of 2,000 tons of china clay, of 3 grades, for ceramic purposes. The company has an order for 4,000 tons, of one grade, for shipment to Germany.

TRI-STATE

Federal Mining & Smelting sinks shaft on Buffalo lease—Federal Homestake mine to be reopened

★Federal Mining and Smelting Co. has started the sinking of a new shaft on the Buffalo lease, a mile and a half southeast of Picher, according to Ward C. Ball of Baxter Springs, district superintendent of the company. The shaft will be sunk to a depth of 180 ft. and an upper run of ore blocked out by previous drilling will be mined on that level. A large derrick and 400-ton hopper, with truckway for dumping ore, is being constructed at the shaft side.

The company plans to rehabilitate the Trilby shaft on the Granby-American and the Granby-Davis shaft at Granby, where stripping operations have been carried on in some shallow lead deposits on fee land owned in that area by the company. J. E. Berg of Wallace, Ida., general manager of the company, visited in the Tri-State recently and made a first-hand inspection of company properties.

★Roanoke Mining Co. is reopening the Federal Homestake mine, a half-mile west of Baxter Springs and south of U. S. Highway 166. A derrick has been constructed over the old mill shaft and ore will be dumped on the ground. Electric power will be used for hoisting and the operation of a 401-cu.-ft. air compressor. Mining operations will be carried on at the 260-ft. level. The shaft has been recribbed about 60 ft. down from the surface. Ore will be trucked to the Dines Blue Mound mill, north of Picher in Kansas, for treatment. O. K. Tucker of Treece is manager and president of the company. Other officers are Wilmer Ingram of Baxter Springs, vice president, and W. A. Brewer of Picher, secretary-treasurer. Otis Burns and Ralph Chambers also are among those interested in the new development.

★F. W. (Mike) Evans has reopened an old shaft on the Harper land near Hero crossing, just south of U. S. Highway 66. The shaft, only a few feet from the highway, caved about 30 ft. from the surface a number of years ago and the highway department put a concrete slab at that depth and filled in a portion of the caved area. Evans recribbed the shaft to the ground level and filled in about the cribbing, using a bulldozer for the purpose. He has broken through the concrete slab, cleaning out washed-in material to a depth of 100 ft.

Plans are to make a cleanup of zinc-lead ore left on the upper level and, ultimately, to do similar development work at a depth of 160 ft. Evans has moved a derrick and 200-ton hopper from the old O'Jack mine. A portable compressor will be used to furnish air for underground operations.

ALASKA

Active operations listed for Council-Solomon, Kougarok districts—Miners' Assn. protests Indian reservations

★Gus Uotila started sluicing at his Ophir property in June and had made one clean-up. A break in Gold Run Ditch was banked and two creeks turned to supply water.

★The total value of metals produced in 1947 was $11,500,000, compared to $9,400,000 in 1946. Lode and placer gold amounted to 302,299 oz. in 1947, valued at $10,580,465, compared to 226,781 oz. in 1946, valued at $7,937,335. The silver produced in 1947 was 69,392 oz. valued at $62,800, compared to 41,793 oz. valued at $33,769 in 1946. It was reported that zinc was produced from Alaskan ores for the first time in 1947.

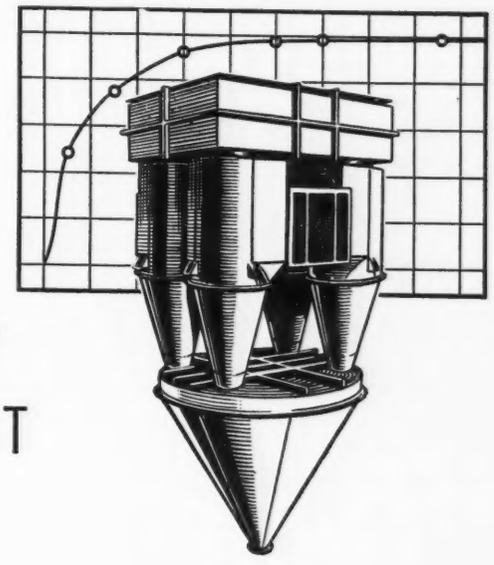
★B. D. Stewart, Commissioner of Mines, reported that Howard M. Fowler, mining engineer, has been appointed associate mining engineer with the Territorial Department of Mines, to succeed J. C. Roehm. Mr. Fowler went to Petersburg first to initiate a program of field examinations, survey of development, and assistance to prospectors and small mine operators. Search for uranium and related ores will be encouraged. He will later be at Ketchikan, Hyder and Wrangell.

★Among the many activities of Alaska Miners' Association during 1947 were: work on request to Secretary of Interior that the creation of more Indian reservations be discontinued; protesting the establishment of the reservation; conferring with Secretary relative to the withdrawal of the reservation from preemption; work on problems of Wage Hour Act, requesting board, lodging and bonuses be excluded from the definition of wages so employers be not compelled to pay overtime on these items; made possible the new gold tax to replace the old 3% gross tax.

★John Havenstrite left Nome early in the season for his dredging property, at Candle. Beside the Arctic Exploration Co. he is interested in jade and asbestos deposits at Shungnak.

★James K. Crowdy, vice president of New York Alaska Gold Dredging Co., was appointed Alaska's chairman of the program committee for the 1948 Metal Mining Convention and Exposition of Western Division of American Mining Congress, at San Francisco, the week of Sept. 20.

★The following operations are reported to be active this season in the Council-Solomon district: Brookins, now working a low bench on Ophir Creek; Brown & Morris on Ophir; Fred Dent, at the mouth of Ophir; Lee Brothers, two dredges on Solomon



1 FORESIGHT IS FAR-SIGHT IN PLANNING dust RECOVERY

Blind buying is bad business. It's far better to know just how well new equipment is going to do its job—*before* you buy. With Buell dust collection systems you *can* know—fully and exactly—how well your dust problem will be solved. Buell offers a unique, pre-order, *fractional* efficiency guarantee. It's the *only kind* of efficiency that accurately predicts dust collector performance. What's more, the guarantee figures may pleasantly surprise you, for only the Buell system has the patented van Tongeren 'shave-off', a really important efficiency development. The complete facts are in a new 32-page catalog—write to the Buell Engineering Company, 60 Wall Tower, Suite 5000, New York 5, N. Y.

buell

Engineered Efficiency in DUST RECOVERY

ALL RUBBER!

IMPELLERS IN THE NEW

BOOTH *Flotation* MACHINE

- NO VIBRATION
- LONG LASTING
- EASY ASSEMBLY

"FLOTS ON AIR—LESS REAGENTS"

WRITE FOR BULLETIN

BOOTH ENGINEERS

72 W. 2ND SOUTH
SALT LAKE CITY, UTAH

Alaska (*Continued*)

River; Lomen Bros. dredge, on Niukluk River, Chester Milligan, Jack La Crosse and H. Janeway operating Wild Goose Dredge, on Ophir Creek; Nels Swanburg & partners, hydraulic operations near mouth of Ophir Creek; and Ungalik Syndicate, on Ungalik River.

In the Kougarok district there are the following: Carey, 4 men working above the mouth of Macklin Creek; Carey, Kanari & Houton Alexander, 4 men on Dahl Creek; Coffee Creek Mining Co., 10 men on Coffee Creek; Courtland, Jenks & Wiedman, 5 men on a new property; Fox Bar Dredge, on Kougarok River; Sam Godfrey, 5 men; Alfred Hanson, on Iron Creek; Minum Brothers, 3 men started work last year; Tolbert Scott & Sons, dredges on Iron Creek; Louis Washington, 7 men on Quartz Creek; and Otto Worm, several men on Windy Creek.

★U. S. Smelting, Refining & Mining Co., which plans to operate 2 dredges at Nome this season, sent employees by plane from Seattle to Nome, early in May, according to Howard G. Wilcox.

★Don Stewart has bought 2 dredges that are working Cordovadas ground on Imachuck River. Kirk Jackson is taking a hydraulic plant to Quigley ground on Solomon River, and Quigley will operate claims adjacent to these workings.

★Thomas Mining & Milling Co., of Nevada, has a crew working on the Olive group of claims, on Culrass Island, more than 50 miles west of Valdez. One of the 3 promising veins has been explored by a 900-ft. tunnel. Samples which have been taken over 6 ft. from the surface of another vein are reported to have yielded high values in gold, silver and lead.

CANADA

New companies and expansion to increase production—Extensive geological programs in Manitoba

★Anti-trust proceedings against the International Nickel Company of Canada and its U. S. subsidiary were closed July 2. The judgment of the New York court was entered without prejudice to the defendants or any admission of the charges against them. Neither of the defendant companies admitted the charges against them and the Canadian parent company accepted the jurisdiction of the New York court "solely for the purposes of the consent judgment." The New York court recognized the Canadian status of the International Nickel Company of Canada and stated that Inco could not be held to account for anything done or left undone in conformity with Canadian or British law. No attempt was made to separate the Canadian company from its U. S. subsidiary or to break up the alleged monopoly, as was charged 2 years ago when the anti-trust suit was brought to trial. U. S. distribution of Inco products was placed under certain stipulations to assure that nickel rolling materials would be distributed in quantities and on terms comparable to those applying to competitive rolling mills.

★At Ottawa, Bill 7, the government's cost-aid plan to provide assistance through an emergency bonus to the gold-mining industry, was formally adopted July 2. The bill had first reading by the House of Commons in December. Favorable action on this legislation is expected to supply substantial benefits to the high-cost producing mines. Estimates prepared by the Ontario Mining Association show bonus payments for this year ranging from $500,000 to Hollinger, $200,000 to McIntyre, and $140,000 to MacLeod-Cockshutt down to $10,000 for both the Kerr-Addison and Delnite mines. Hoyle, Young-Davidson, and the Leitch mines would each receive an estimated bonus of $20,000.

★Several new uranium prospects have been reported this year in Canada. The grade of ore being produced is reported to be under 1%, which is raised by concentration to about 30%. Purchases by the Crown agency are to be restricted to concentrates grading 10% or better by weight of uranium oxide. Based on experience at the Eldorado Mining and Refining, Ltd., where the most important occurrence to date is being developed, $2.75 per lb. of contained uranium has been established as a reasonable price, which is to be in effect for a considerable length of time.

★Mine expansion is being planned by many operating companies across Canada, in addition to the very substantial new ore disclosures secured in recent exploratory work undertaken by Quemont, Sherritt Gordon, and Hudson Bay Mining & Smelting. Production this year is expected to show a substantial increase in Canada as the result of steady improvement in the labor supply and the availability of materials. By the end of 1948 Noranda is scheduled to double the present rate of production to 2,000 tons a day. Kerr-Addison also intends to double the rate of output to 4,000 tons a day. Madsen Red Lake will step up the mill rate to 800 tons, Malartic Gold Fields to 1,500, and Senator-Rouyn to 600 tons. Another mill increase in Quebec has been announced for Canadian Malartic, which will advance to 1,200 tons daily. Hosco has secured initial output of 150 tons. Powell Rouyn is resuming operations, partly on a custom basis. Ontario will have three new producers in the Red Lake camp and two will start production in British Columbia, the Tofino and Vananda properties.

ONTARIO

★Activity in the Red Lake area includes underground work at 8 properties. The Madsen mine is now preparing to double mill capacity. Cochenour-Willans is reported to be operating at capacity of 220 tons and continues to put new ore in sight. Hasaga, operating close to the capacity of 400 tons a day, has doubled its ore reserves. McKenzie and McMarmac continue to report profitable production. The Dickenson and Starratt Olsen are erecting mills that should be operating later this year, while the Campbell Red Lake plans output of 300 tons or more daily in 1949. Development work is also in progress at the Richmac and Orlac properties.

★New uses for magnesium, as a result of research and development carried on at the Haley plant, are reported by J. D. Harrington, vice president and general manager of Dominion Magnesium, Ltd. In addition to high purity magnesium alloys, production last year included calcium metal, barium and strontium. Equipment is to be operating before the end of the year for producing extruded shapes. The company reported a net operating profit of $151,149 compared with operating loss in the previous year of $130,807. Current assets were $1,321,972 against liabilities of $162,582.

★B. W. Lang, president of Porcupine Reef Gold Mines, has announced starting production at the rate of 150 tons per day. Development of the property has been financed and directed by Broulan Porcupine Mines and the Broulan mill is being used for treating ore from the new shaft. The main zone on the 500 level has a length of 521 ft. averaging 6.9 ft. in width. Values are reported from 0.14 oz. to 0.9 oz. per ton. Two orebodies indicated on the 800 ft. level show a total length of 520 ft. with a width of 6.6 ft. and values from 0.2 oz. to 0.35 oz. per ton. Mining widths have not yet been determined but are stated to be possibly 21 ft.

★Dickenson Red Lake Gold Mines in June started construction of the 200-ton mill, as stated by J. M. Brewis, managing director. Production is scheduled to start this fall. The mill and mining plant, including a roaster, have been moved to the Dickenson from the Gold Eagle property. The roasting method in use by Cochenour-Willans is being employed to improve recovery to 92% or better. Some additions to the mill and the installation of a picking belt are expected to raise the rate of production to 250 tons. Mill heads of $12 per ton are estimated, with costs running about $8. The extension of the Campbell south zone is believed to be an important ore source. This has been drilled for a length of 1,000 ft. Probable ore is estimated at $207,215 tons.

★Preproduction expenditures at Camp-

SuperDuty OUTPERFORMS ANY OTHER CONCENTRATING TABLE

• SuperDuty Diagonal Deck Concentrating Tables handle new feed faster and with greater efficiency than many engineers would expect from past patterns of table performance.

• Capacity is governed partly by the characteristics of the feed, but when you consider that the SuperDuty places 75% more effective working riffles in the direct path of the material flow, you can appreciate that separations are cleaner and that they can be cut with far greater accuracy than is possible on ordinary tables.

• Thus, SuperDuty Tables produce higher grade products and reduce the quantity of middlings for recirculation . . . Room is left, thereby, for a larger volume of new feed.

• For full information, write for Bulletin 118-A.

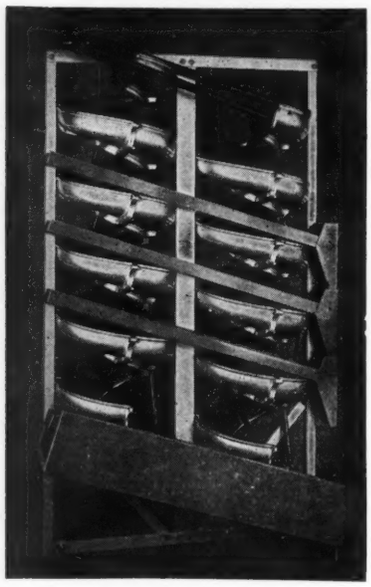
CONCENCO TYPE "CPC" CLASSIFIER

This All-Steel Constriction Plate Classifier is available in 1 to 10 or more cells. Each cell has a pressure chamber at bottom, a sorting column just above, and a launder section at top. Advantages offered are: (1) sharp separation, (2) accurate classification, (3) as many spigot products as there are cells, (4) continuous discharge, (5) no moving parts, (6) low maintenance cost.

THE DEISTER ★ CONCENTRATOR COMPANY
903 Glasgow Ave. • Fort Wayne, Ind., U.S.A.
CONCENCO PRODUCTS

★ *The ORIGINAL Deister Company* ★ *Inc. 1906*

HUMPHREYS SPIRAL CONCENTRATOR



LOW COST OF INSTALLATION
NO MOVING PARTS
LOW OPERATING COST

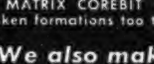
Engineering Division
The Humphreys Investment Co.
First National Bank Building
DENVER 2, COLORADO

CHAMPION
◆ DIAMOND ◆
CORE BITS
LAST LONGER

CASING BITS — CORE BITS — REAMER SHELLS

THREE TYPES:—
BRONZE MATRIX COREBIT for solid rock and softer formations.
NICKEL MATRIX COREBIT for drilling difficult formations.
TUNGSTEN MATRIX COREBIT for extremely hard or broken formations too rough for any other type.

We also make
DIAMOND CASING BITS
and **REAMER SHELLS**
with "Champion" Diamond Inserts,
1" long, ⅜" wide, 7/32" thick



In three types — Longyear, Sullivan and Sprague & Henwood, single or double tube. CHAMPION DIAMOND INSERTS brazed in your special shells, or available unattached for your own brazing.

SEND FOR THE CHAMPION DIAMOND CATALOG AND PRICES.

CHAMPION DIAMOND CO. INC.
551 Fifth Avenue
NEW YORK 17, N. Y.
Cable Address — WILLARTZ NEW YORK

Ontario *(Continued)*

bell Red Lake are estimated at $2 million. Last year drifting in ore amounted to 2,970 ft. Two raises were also completed in ore, from the fourth to the third level, and from the first level to within 50 ft. of surface. Ore reserves last December were estimated at 147,230 tons in place grading better than a half ounce per ton. Work has been started in the central zone after development had been confined to the south or "A" zone, where 1,000 ft. on the length remains to be explored.

★Gold recovery at Dome Mines averaged $9.41 per ton last year from treating 595,200 tons of ore. Total operating charges were $5.50 per ton, up from $5.24 in the previous year, as reported by the general manager, Robert E. Dye. Ore reserves increased 10,000 tons in 1947 to 2,508,000 and development work was up 3,000 ft. to 30,669 ft. Diamond drilling amounted to 67,301 ft.

QUEBEC

★Five diamond drills are now at work on the property of Gulf Lead Mines, as reported by M. E. Holzman, president and managing director. The property, located on the east coast of Hudson Bay, has been undergoing systematic exploration for several months and more than 40 drill holes have been completed to date. Promising mineralization has been reported in a flat-lying limestone at depths below 400 ft. Surface ore exposures over a large area have been investigated. L. B. Almond is consulting engineer.

★Waite Amulet Mines reports net working capital of $9,133,643. In the Waite, or northern portion of the property, operations came to an end last January, when mining was resumed on the "C" orebody. J. Y. Murdock, president, reports that production is to be undertaken on the "F" orebody, of which the west and southwest portions will be further explored. On the lower "A" and upper "A" orebodies reserves are adequate for about 4 years of production.

★Anglo-Rouyn Mines has opened a length of 158 ft. on the No. 1 vein in drifting on the 900-ft. level, it is reported by the managers, Technical Mine Consultants. The drift width of 7 ft. gives an average of 0.345 oz. per ton gold.

★The Sigma Mine at Bourlamaque reports that increased operating costs resulted in lower earnings last year in spite of an advance in recovery from $1,838,840 to $2,105,051. The general manager, J. G. McCrea, reported an increase in ore reserves to 1,339,700 tons averaging 0.2065 oz. per ton, but development is still short of requirements.

★In the Bachelor Lake area the Dome property has been showing encouraging results in base metals. Channel sampling of two surface exposures returned values over widths of 6 to 9 ft. as follows: 36.3 to 58.26 oz. silver per ton; lead 2.86 to 4.48%; and zinc 19.51 to 20.16%. Some X-ray drilling has been done, which confirmed the sampling results.

MANITOBA

★The Jeep Gold Mine, Ltd. reports that a total of 2,018 tons of ore from development work has been treated at the San Antonio mill, yielding 2,095 oz. of gold, or an average of 1.038 oz. per ton.

★Sherritt Gordon Mines, Ltd., has commenced a program of deep diamond drilling from which it is proposed to carry out geophysical exploration for a lower EL orebody at Lynn Lake. The first hole showed sections of disseminated sulphides, some of which may be economic. Early in June this hole had passed a depth of 1,750 ft.; the objective is 2,500 ft. It is proposed to drill 2 or 3 additional holes at 400-ft. intervals.

★During the first quarter of the year, 117,492 tons of ore were mined from the Sherritt Gordon mine at Sherridon, from which were produced 4,841,755 lb. copper; 2,326 tons of zinc concentrate; 1,149 oz. gold and 39,864 oz. silver. Due to the necessity of building up an inventory, only 1,375,135 lbs. of copper were sold which, after deducting costs of $178,829, realized a profit of $111,058. Total profit for the period after provision for taxes but before write-offs was $203,125. Exploration expenses totaling $577,974 were high as a full year's allotment of supplies and equipment amounting to 3,144 tons was transported to Lynn Lake.

★Northern Chemicals, Ltd., has been incorporated in the province to develop spodumene-bearing deposits in the vicinity of Cat Lake, east of Lake Winnipeg. Mining and concentrating of the spodumene will be carried on under contract to the Lithium Corporation of America for a period of 5 years. Consideration is being given to the erection of a chemical plant in Manitoba to supply Canadian and overseas markets.

★The Geological Survey of Canada is conducting an extensive program of field investigations within the province which includes permafrost studies in the vicinity of Churchill, ground water investigations in southern Manitoba, and 5 geological mapping parties under the supervision of J. M. Harrison. The Pre-Cambrian areas being mapped are Nokomis-Moody Lakes, Collins Point, Uhlman Lake, Brochet and Weldon Bay.

★The Mines Branch, Manitoba Department of Mines and Natural Resources, have also placed 6 geological parties in the following areas underlain by Pre-Cambrian rock: Cockeram Lake map area, Dunphy Lake map area, Sickle Lake sheet, English Brook map area, and Wanipigow Lake sheet.

Work commenced in 1947 at Cat Lake and Maskwa Lake sheets is to be continued. In the southwest part of the province stratigraphic mapping and industrial mineral studies are being continued.

★The Mines Branch recently published amendments to the regulations under "The Mines Act" for the disposal of mining claims on Crown Lands. The more important changes are: a single license holder may now stake 9 claims in his own name or on behalf of other licensees; 36 contiguous claims may be grouped for assessment work; assessment work has been changed from a time basis (25 days per claim) to a definite quantity of work performed; geological and geophysical surveys are accepted if performed by a person registered under the Engineering Profession Act. The new regulations also provide for the granting of prospectors reservations, geophysical reservations and the licensing of airborne geophysical investigations.

SASKATCHEWAN

★According to a preliminary report by W. James Bichan, Director of Mineral Resources, Province of Saskatchewan, two Government-aided prospectors, W. A. Richardson and L. N. Mac Arthur, have picked up radioactive indications on Geiger counters over a wide area north of Lac La Ronge. By the end of May the men had traced radioactive occurrences for a distance of 6 miles at intervals along the Montreal River. Early in June Mr. Bichan, the two prospectors and other geologists made a close check of a number of the showings and an accelerated count was determined over all exposures of dike material within 2 miles of the Montreal River on the west bank. Showings to the east of the river gave an increased count but were not in the same class as those to the west. The outcrops examined would aggregate several million square feet and would thus indicate a large tonnage of material with radioactive content.

Late in June J. L. Phelps, Resources Minister of Saskatchewan, announced that later samples found in the Lac La Ronge area had assayed many times better than the original ones. Mr. Phelps added that several planes had brought prospectors to the area to stake claims adjacent to the discovery reservation.

BRITISH COLUMBIA

★At the Consolidated Mining & Smelting Co. cities, Trail and Kimberley, extensive loss and damage resulted from the recent floods. The Columbia River at Trail, and Mark Creek at Kimberley, inundated residential and business areas. The management of the C. M. & S. Co. has announced that the company will furnish engineering and substantial financial aid to rehabilitate employees in both

MINING, MILLING
SMELTING & REFINING
PLANTS

—

DESIGN & CONSTRUCTION

PARSONS

Any Plant
Any Size
Anywhere

The Ralph M. Parsons Company
Engineers • Constructors

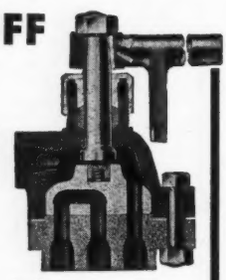
617 SOUTH OLIVE STREET, LOS ANGELES

SAN FRANCISCO
2017 RUSS BUILDING

WASHINGTON
1025 CONNECTICUT AVENUE

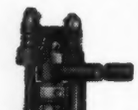
HOUSTON
3401 BUFFALO DRIVE

STANDARDIZING
on Nicholson Valves
➔PAYS OFF



Style E for air, gas, oil, steam, water; press. to 500 lbs.

A survey of large users of Nicholson cylinder control valves shows these leading reasons for their specification: 1) Special seats, don't cut out. 2) Fast, positive acting. 3) Stuffing box easily repacked. 4) heavy - bodied, take abuse. 5) Neat, installed in any position. Nicholson control valves are furnished for all mediums and types of operation—lever, foot, solenoid and motor. Choice of 6 metal combinations to meet specific needs. Pressures to 5000 lbs.

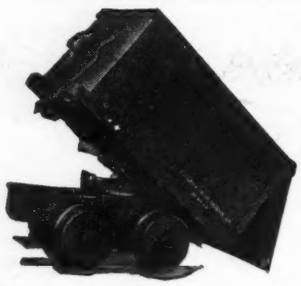


Style H, pressure to 5000 lbs.

Catalog 546

W. H. NICHOLSON & CO.

201 Oregon St., Wilkes-Barre, Pa.



A Make your play WITH ACES!

In the final showdown, LOWEST COST PER TON MILE HAUL is the stake you are playing for.

Why not standardize on CARD CARS! From Cobalt to Sonora, practical mining men say, "Every Card Car is an ACE in the hole".

Ask for Catalogue 40.

C.S. Card Iron Works Co.
Denver, Colorado

British Columbia *(Continued)*

communities, and advises that employees should not be concerned over the financial aspects of restoring their homes.

Operations of mines in the Hedley district, including the Hedley Mascot and Kelowna Exploration Co.'s Nickel Plate, were temporarily disrupted. In the Lillooet mining division, flash floods did some slight damage at Bralorne and knocked out one of Pioneer's power plants. The road to Bralorne's new gold prospect in the Yalakom district was badly damaged and all work has been suspended at this property. The crew has been withdrawn and it is expected some weeks must elapse before it will be possible to restore normal transportation facilities.

★Moccasin Mines, Ltd., a recent entry into the British Columbia dragline dredging fields, is reported to have made an initial cleanup valued at $29,000 after a running-in period of approximately 2 weeks.

Another Larsen and Harms venture, Summit Mines, Ltd., has installed and is now operating a 3-yd. dredge and washing plant on Pine Creek near Barkerville, in the Cariboo district.

★Marking the termination of one of British Columbia's most successful mining ventures, the final meeting of Premier Gold Mining Co., Ltd., (in voluntary liquidation) was held in Vancouver last month. Shareholders heard the report of the liquidator as to distribution of the company's assets and moved enabling resolutions permitting destruction of books and records in one year's time.

★At the Salmon gold mine, being developed by Morris Summit Gold Mines, Ltd., crosscutting, drifting and raising at the 3000 ft. (main haulage) horizon has opened 400 ft. of ore grading an average of 0.77 oz. gold per ton across an average width of 34 inches. A good oreshoot has also been opened in the upper tunnel and recent work on the 3002 vein shows an oreshoot of 100 ft. assaying 0.79 oz. gold per ton across an average width of 69 in. The present drilling program has the immediate objective of filling in the pattern between previous intersections obtained and the main haulage development. Results obtained in the first 5 holes drilled indicate excellent values and important extensions to the orebodies.

★Island Mountain Mines Co., Ltd., reports May production at its Cariboo district property was 1,220.79 fine oz. of gold from 3,256 tons of ore.

★Development footage during 1947 at Pioneer Gold Mines of B. C., Ltd., the greatest since 1938, consisted of 3,379 ft. of drifting on the 27 vein, 264 ft. of drifting on the 40 vein, 455 ft. of slashing and miscellaneous workings, 2,238 ft. of crosscutting, 1,489 ft. of raising, and 242 ft. of shaft, in addition to 3,595 ft. of diamond drilling.

The development results on the 27 vein are reported by managing director, Dr. H. T. James, as "exceptionally good." The 25-level has reached the limit of the vein, with a total drift length of 2,001 ft., of which 1,374 ft. is in ore averaging 0.70 oz. gold per ton over a width of 5.0 ft. An estimated 1,500 to 2,000 ft. of drifting remains to be done on the 27 vein on the 22, 23, and 24 levels. From the drifting done on this vein, ore lengths aggregating 2,160 ft. were opened showing 63.9% of this work to be in ore. These ore lengths gave an average exposed vein width of 4.55 ft., and an average grade of 0.75 oz. gold per ton. Assuming a reasonable dilution factor there is approximately 350,000 tons of ore with a grade of about ½ oz. in this section.

While daily tonnage treated was well below capacity during the year ended March 31st, operation of the Pioneer mill was otherwise normal. From 53,715 tons hoisted the mill treated 51,138 tons after sorting for a daily average of 140 tons. Mill heads were 0.447 oz. gold per ton and tails were 0.0122 oz. Recovery was at an average rate of 97.2% with production aggregating 22,260.46 fine oz. of gold and 4,118 fine oz. of silver. After provision for depreciation, depletion, and write-offs for exploration and prospects, a net loss of $156,793.44 increased the deficit account to $265,518.45. Current assets at the end of the fiscal year were $483,655, and current liabilities were $130,501. Capital expenditures on plant and equipment were $88,449.

★Milling at the Texada Island property of Vananda Mines (1948), Ltd. is scheduled to commence in September. Ore shipments, and later concentrate shipments, will be made to the United States.

★While the Hedley Mascot mine operated continuously during 1947, mill overhaul and changes in the flow sheet restricted ore treatment to 8½ months. During this period while the mill was operating Hedley Mascot Gold Mines, Ltd. was able to make a small operating profit, $3,114.11. Revenue from concentrates and bullion sold was $466,552 while operating and miscellaneous expense for the year aggregated $521,134.

Exploration and development representing an expenditure of $90,867 included 1,217 ft. of drifting, 770 ft. of raising, and 19,105 ft. of diamond drilling. From the Mascot mine, 29,151 tons were milled averaging 0.385 oz. gold per ton for a recovery of 1,693 oz. in bullion and 9,071 oz. in concentrates. Good Hope ore totalling 2,513 tons trucked to the Mascot mill during the summer months gave mill heads of 0.623 oz. gold per ton and yielded 1,150 oz. in bullion and 269 oz. in concentrates.

★During the third annual "safety week" held recently at the Trail operations of The Consolidated Min-

ing and Smelting Company of Canada, Ltd., there were only 3 lost-time accidents in 207,848 man hours worked. During the two previous campaigns only one lost time accident was recorded on each occasion. As of May 14, the C.M.&S.Co.'s Alberta nitrogen plant at Calgary, Alta, had established an all-time record of 1 million man-hours worked without a lost-time accident.

★Production from the Taggart Pass property of Columbia Gypsum Products, Inc., near Windermere, B. C., was scheduled for the end of July. Incorporated in the State of Washington, Columbia Gypsum is preparing to market products from a high grade deposit of gypsum at Taggart Pass which will be mined by means of open-pit methods.

YUKON

★Vigorous protests against legislation which would have compelled claim holders to have claims surveyed at an estimated cost of $200 per claim has resulted in provision of revised regulations under the Yukon Quartz Mining Act. During this year surveys will be made only in the Mayo district. Any claim holder in that district who pays $100 a claim is entitled to have his holdings surveyed and this payment will be accepted in lieu of representation work for the year. It will not be necessary for claim owners in the Dawson and Whitehorse mining districts to apply this year for an extension of time in which they may have their claims surveyed as any action toward cancellation will be withheld during 1948. Action to be taken next year will depend on conditions obtaining at that time.

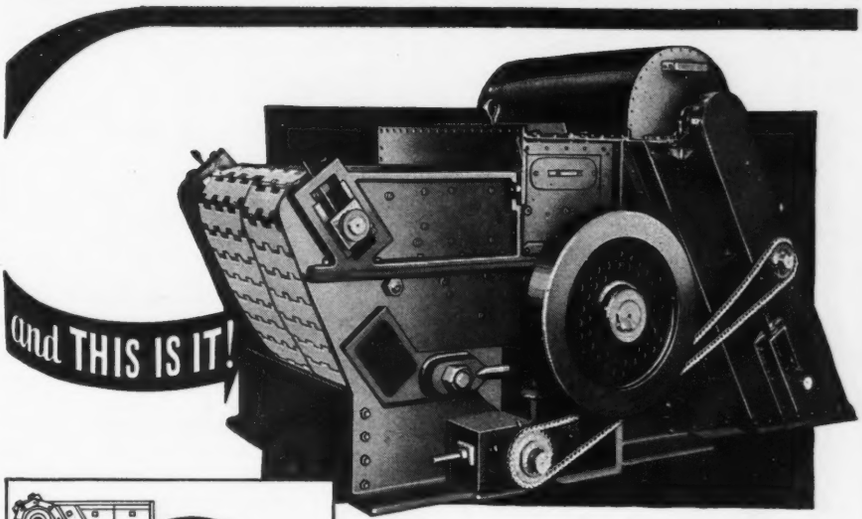
MEXICO

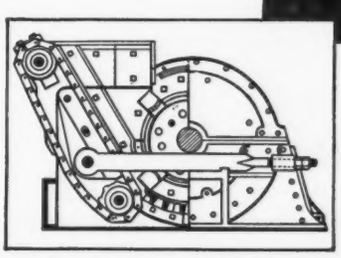
Altos Hornos functions on reduced scale during labor tie-up—Guanajuato Mining Association organized

★Forty-five thousand miners, two thirds of those in Mexico, are now covered by revised collective labor contracts and the rest will soon have that protection, as the new pacts will govern settlement of mining work conflicts. Augustin Guzman V., secretary general of the miners union, stated that the major labor trouble in Mexican mining is that of the practical closure by Altos Hornos de Mexico, S. A. of its iron and steel works at Monclova, Coahuila.

Altos Hornos' closure was something new in Mexican mining and industrial annals. The company, which was established by an American-Mexican syndicate some 6 years ago but is now being administered by the Nacional Financiera, S. A., the Mexican Government's fiscal agency, wearied of a series of "paros" (short

There IS a difference in HAMMERMILLS





Uniformly high quality of product... enormous crushing power... lower drying costs... result from the Continuously Moving Breaker Plate ... the patented non-clog feature that accounts for Dixie's greater efficiency. At left—Sectional View of the Dixie Non-Clog Hammermill.

Dixie's distinguishing feature, the Moving Breaker Plate*... is your guarantee of

- RECORD CAPACITY
- MAXIMUM PRODUCTION
- ECONOMY OF OPERATION

The Continuously Moving Breaker Plate, the vastly improved non-clog crushing principle developed and perfected by Dixie engineers, has demonstrated its superiority in the reduction of raw materials in hundreds of installations all over the world. There's only one Dixie Hammermill. Don't be misled by claims of "just as good." Make it a Dixie . . . and make sure!

*U. S. Patents Granted and Pending.

DIXIE

DIXIE HAMMERMILLS FOR CRUSHING GRINDING • PULVERIZING • SHREDDING

Our latest bulletin, "More Efficient Crushing of Raw Materials," convincingly sums up Dixie's unique money-saving features. Request your copy today.

DIXIE MACHINERY MFG. CO.
4204 Goodfellow Ave., St. Louis 20, Mo. • 104 Pearl St., New York, N. Y.

FOR ALL DIG-AND-HAUL WORK!

Sauerman Cableway pictured above is digging gravel from bar in river and hauling to top of screening plant in one operation. Handles 700 cu. yd. a day at cost of few cents a yard.

CUT TIME IN HALF with Sauerman

This picture shows a small Sauerman Scraper handling large stockpile of silica at processing plant. Scraper stocks out material from washery and reclaims at regular intervals from stockpile to dryer.

Scrapers and Slackline Cableways

Sauerman Crescent Scraper Bucket

Digging, hauling and dumping operations are combined in one continuous process making possible big savings in both time and labor. Only one man is required for complete control of the operation. Sauerman Cableway and Scraper Machines provide wide range of handling capacities and long-reach. Remarkably low operating and maintenance costs. Gasoline, electric or Diesel. Write for catalog now.

★

SAUERMAN BROS., Inc.

584 S. Clinton St. Chicago 7, Illinois

ATKINS

CROSSCUTS

● The job of the man behind the saw isn't an easy one—but you can lighten it with an Atkins Crosscut. For here's a saw that runs smoother, cuts through piling, big timbers or heavy planking quicker without back-breaking effort. Because it is tapered uniformly from toothed edge to back throughout the length of the blade it clears perfectly without pinching. And an Atkins takes the toughest going right in stride. Made of famous "Silver Steel" specially developed for the purpose, it's razor-keen teeth hold their edge through extra long cutting periods.

One-man and two-man—Atkins makes Crosscuts for every kind of crosscut job. Shown above is the popular No. 390.

AAA TRADE MARK ATKINS "ATKINS ALWAYS AHEAD"

E. C. ATKINS AND COMPANY • Home Office and Factory: 402 S. Illinois Street, Indianapolis 9, Ind. • Branch Factory: Portland, Oregon
Branch Offices: Atlanta, Chicago, New Orleans, New York, San Francisco

Mexico *(Continued)*

sitdown strikes), locked out its some 2,600 workmen when their leaders informed the agency that there would be a "paro" of an hour each shift as a protest of the company's discontinuing selling liquor in an ice cream parlor on its property that was much patronized by the workmen. Later, the leaders admitted that they had erred in issuing this order, apologized and resigned their jobs with the company. Altos Hornos announced its willingness to recontract all its workmen, excepting the 139 it holds responsible for the "paros." The miners union agrees with the company. But the workmen demand half pay during the time of the closure, a snag to a settlement. Altos Hornos is functioning with 300 uncontracted employees and is producing one third of its normal output.

★Guzman doesn't regard as a conflict the unique case of La Consolidada, S. A., operating iron and steel and allied works in Mexico City and Piedras Negras, Coahuila, now controlled by Shields & Co., New York banking house. La Consolidada, saying that it lost 570,000 pesos ($118,125) in the past 4 months in its bronze, brass and steel departments, desired to close the brass department and pare personnel and wages in the other 2 sections, which proposition was opposed by the workers. La Consolidada has now suggested that the plants be turned over to the workmen to run cooperatively. The miners union, to which the workmen belong, is considering the proposition but the Confederation of Chambers of Commerce strongly opposes it.

★"El Universal," an important Mexico City newspaper, has charged that the Cia. Minera de Oaxaca, S. A. mined and exported during the past 8 years tungsten worth over 100 million pesos ($20,650,000) by trespassing the rights of holders of claims to La Paz, Ampliacion de la Paz and El Soccoro tracts in Mixtepec municipality, Oaxaca, asserting that the operations were clandestine and illegal. The accusation is being investigated by the Ministries of Finance and National Economy. Official reports show that Mexico produces very little tungsten and that exports of that metal from this country are practically negligible.

★Coincident with celebration of the 400th anniversary of the start of mining, principal industry of the state, Guanajuato held conferences under the auspices of Governor Antonio Castorena, in the state congressional building, Guanajuato City, between representative mining employers, miners' leaders and the State Round Table's permanent committee, to find means for relieving the sharp depression Guanajuato mining is suffering. Two immediate results of this conference were the naming of a committee of mining employers and miners

to interview Antonio Ruiz Galindo, Secretary of National Economy, in Mexico City, and lay before him problems of Guanajuato mining, and the establishment of the Guanajuato Mining Association, of which Ing. Severiano Espinosa was appointed president. The meetings also favored the proposition, presented last March at the national mining convention in Mexico City, of establishing mining enterprises that are totally local.

★The Cia. Minera y Explotadora de El Amparo, S. A., Guanajuato, has averted a strike, at least temporarily, by arranging with executives of the miners union in Mexico City to have auditors chosen by the union to examine its books. The company hopes the examination will demonstrate to the union's chiefs that not only is the company unable to grant its workmen's demands for a wage raise and other money concessions but that its business is so bad that it must pare personnel and the pay of retained employees. If, as the miners hope, the examination shows the company's business isn't as bad as it claims, the strike will be called unless El Amparo bows to the union demands.

★Prominent among recent peacemakings on the mining scene was that made by the Cia. Minera de Cerro Mercado, S. A., which exploits the huge iron mountain, the Cerro de Mercado, near Durango City. With the personal intervention of Lic. Manuel Ramirez Vazquez, Acting Secretary of Labor, the company revised its collective work contract to feature a general 20% raise in wages and allowing free medical attention and medicines, not only for its workmen but for their families as well, 1,000 days pay indemnification for deaths from professional causes, and free life insurance policies of 1,000 pesos ($203.50) each. American Smelting's Angangueo unit, Michoacan, also gave much to attain peace—a 10% wage boost, 25,000 pesos ($5,175) for the workers consumption cooperative society, 650 pesos a month for the miners' transportation and two buses to provide that transportation.

BOLIVIA

Bolivia plans for tin concentration plant—Nationalist movement attacks Patiño, Aramayo and Hochschild

★During recent months the mining picture in Bolivia has been characterized by an atmosphere of welfare and optimism, due in large part to the rise in the price of tin, announcement of plans for a tin concentration plant and general good relations between workers and management. The Government's attempt to cut every "demagogical activity" of politicians at the mining centers has succeeded

I'M YOUR MAN

FOR TRIPLE SAVINGS
... AND THE *NEW*
"VIC-GROOVER"!

VICTAULIC COUPLINGS give piping systems a *flexibility* that minimizes bends and fittings . . . keep every joint *leak-tight* under pressure or vacuum... make joints *positive-locked* so they can't blow off or pull out under vibration or sag.

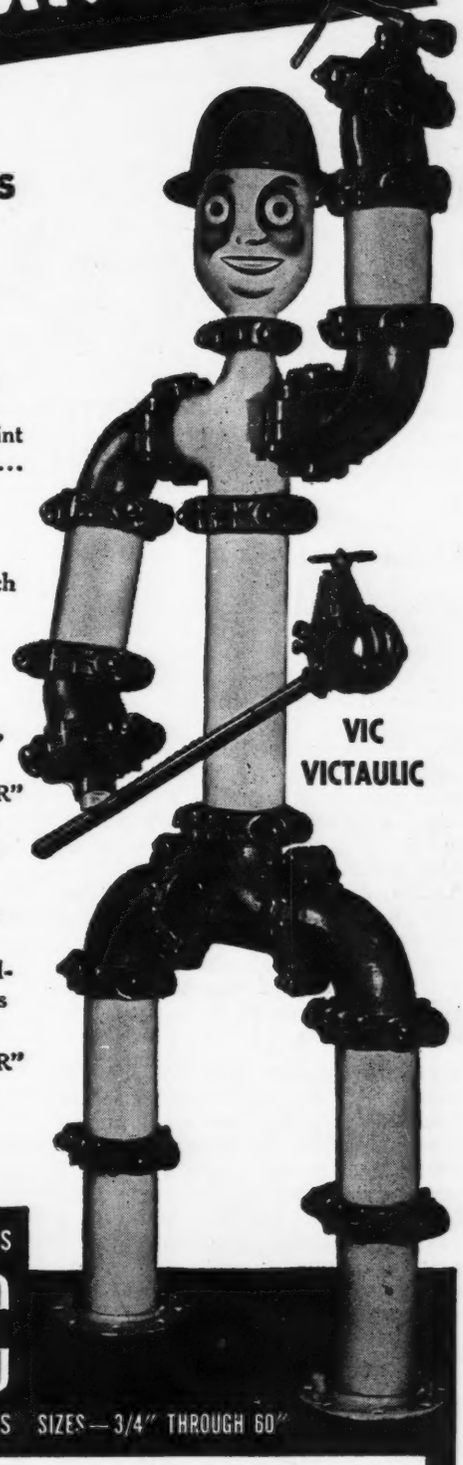
JUST A FEW TWIRLS of a T-wrench buttons up a Victaulic system...or unbuttons it—with no special skill or training needed!

THIS SAVES YOU money, man-hours, material...in assembly, repair, or salvage!

AND NOW! A new "VIC-GROOVER" grooves pipe ends automatically and twice as fast...with half the effort of ordinary pipe threaders.

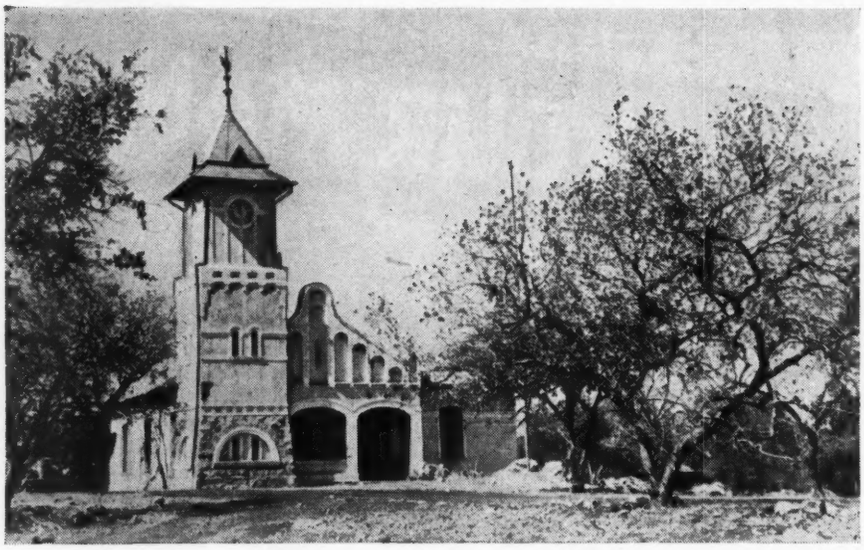
FOR FULL ECONOMY, make your piping system *ALL*-Victaulic—with Victaulic Couplings and Victaulic Full-Flow Elbows, Tees, and other Fittings ...and the new "VIC-GROOVER"!

Write today for new "VIC-GROOVER" Catalog VG-47...and also ask for Victaulic Catalog and Engineering Manual No. 44.



SELF-ALIGNING PIPE COUPLINGS
VICTAULIC
EFFICIENT FULL FLOW FITTINGS SIZES—3/4" THROUGH 60"

VICTAULIC COMPANY OF AMERICA
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.
Victaulic, Inc., 727 W. 7th St., Los Angeles 14, Calif.
Victaulic Company of Canada, Ltd., 200 Bay St., Toronto 1
For export outside U. S. and Canada: PIPECO Couplings and Fittings:
Pipe Couplings, Inc., 30 Rockefeller Plaza, New York 20, N. Y.
Copyright 1948, by Victaulic Co. of America



GENERAL OFFICES OF TSUMEB CORP, LTD., Tsumeb, Southwest Africa, the copper-lead mine once German-owned but now operated by Newmont Mining Co. of New York in association with American Metal Co. The old church is said to provide cool and comfortable quarters for the mining company.

Bolivia *(Continued)*

in dispelling much of the resentment prevalent among workers last year.

Disturbing this tranquility, however, is an active campaign afoot against the Patiño Mines and Enterprises, led by Fernando Diez de Medina, whose strongly nationalist group emphasized "tyranny of persons who after making money in the country's mines, didn't like to make investments in Bolivia or to help in her progress." Also attacked in the campaign were Aramayo's and Hochschild's mines. "El Diorio," the paper backing the nationalists in their charges, has been closed. This, too, was blamed on Patiño, as one of the large stockholders of the paper is an important employee there.

★The Government of Bolivia has authorized the Banco Minero to secure from the "Export-Import Bank or any other American or Bolivian source" $6 million for the construction of a tin concentration plant at Oruro, to have a capacity of 6,613 short tons a year. The general plan consists of a plant for sulphuric acid, one for hydrochloric acid and derivatives and one for lixiviation. Officials pointed out that the plant will give many small miners the opportunity to work the sulphur deposits at the Chilean border and salt deposits in Potosi. But the important point of the work is that for the first time Bolivia will be able to export low-yield tin with economic benefit.

★The metallurgical and chemical laboratories of Banco Minero are proving most helpful, testing minerals from all mines in Bolivia as well as conducting experiments of ore beneficiation. The two laboratories are the largest of the kind in Bolivia, directed by men with wide experience in the U. S. as well as Bolivia. Mr. Louis Allen of the Chemical Construction Corp., New York, who conducted the survey in connection with the Oruro tin concentration plant, found the laboratories an important aid in his work.

CHILE

Tatio geysers studied as power possibility—Ore buying agency opened at Caja schedules

★Señor Rodolfo Michels, one of Anaconda's Vice Presidents in Chile, visited the Secretary of the Treasury to announce that the company has signed a contract with Foley Brothers to build the first section of the new flotation mill to treat Chuquicamata sulphide ores. About $60 million will be spent on this section.

★The local Mining Associations of Atacama were organizing an important mining congress to be held at Copiapo on July 17 and 18 at which the Chilean Mining Society, the Chilean Institute of Mining Engineers and the Mining Sections of Coquimbo would also be represented. Senators and representatives from the mining provinces, as well as officials from the Mining Bank, were to attend this congress to discuss only matters pertaining to the Chilean mining industry.

★For many years now some Chilean engineers have been studying the possibility of putting to practical use the source of power latent in the Tatio geysers located to the east of Calama in the province of Antofagasta. The whole project has been based on parallel conditions in Italy where a similar source of energy has been harnessed. According to the Italian engineer, De Lava, who has made the preliminary estimates, it will be possible to transmit the thermovolcanic energy from Tatio to Central Chile, a distance of 800 miles at 360,000 volts with an investment of $20 million for an initial transmission of 200,000 kw.

★Senator Aldunate has introduced a bill which will enable miners to exchange their gold for foreign exchange and use this for importing goods. Miners are asking that the foreign exchange so obtained not be considered within the official budget for foreign exchange.

★At a cost of $1,300,000, conveyor belts are being installed at one of the Chilean ports in order to decrease the present high cost of loading nitrate.

★Sali Hochschild and Co. is opening in Vallenar an ore buying agency where the miners will be paid the same schedules for their ores as those fixed by Caja Credito Minero.

AFRICA

Union Corporation marks 50th anniversary—Middle Wits cedes areas to new Kennecott-Anglovaal Company

★Union Corporation, Ltd., organized as A. Goerz & Co. in December, 1897, celebrated its 50th anniversary at the annual meeting in Johannesburg in May, with Brendan Bracken of London, chairman of the board, presiding. Last year the corporation's gold production was 1,609,987 fine oz., or 15% of the total Witwatersrand production. Worldwide interests of the Union Corp. include the San Francisco mines of Mexico, Ultramar Co., Uruwira Mines, Ltd. in Tanganyika, British Enka, Bay Hall Trust, Ltd. and the Tsumeb Corp., Ltd., the last representing capital of Newmont Mining Co. and the American Metal Co.

Reviewing operations on the Witwatersrand during 1946 and 1947, Mr. Bracken pointed out that reduced operations were caused by strike interruptions, but that the root of the industry's troubles could be found in rising costs and shortage of labor and materials, or the general effects of worldwide inflation.

★About 19,000 acres of land in the Steynsrust area of the Free State will be investigated under a joint drilling program of the newly formed Anglo-American Prospecting Co. and Anglo-Rand Mining and Finance Corp. The Anglo-American company, representing 60% interest, will direct the technical work. Anglo-Rand and Goldfields Exploration (OFS), Ltd., from whom the land was secured, each hold 20%.

★Of the 9 shafts being sunk in the Free State gold area, greatest progress is being made at St. Helena No. 3 shaft, more than 2,160 ft. down in June, and the No. 4 shaft, more than 430 ft. deep. The other shafts are

Welkom Nos. 1 and 2, Free State Geguld, Freddies North Lease area shafts Nos. 1 and 2, Freddies South Lease area shafts Nos. 1 and 2.

The Freddies shafts are 47 x 11½ ft. (internal measurements); because of the nature of strata near the surface, reinforced concrete mats were designed to safeguard the shafts. At the end of May North shafts Nos. 1 and 2 were 51 and 176 ft. respectively, sinking at No. 1 having been suspended during April and May to erect permanent headgear. Plans are to sink the shafts 5,600 and 5,300 ft. to intersect the Basal Reef, principal gold carrier in this area, at 5,400 ft. and 5,100 ft. respectively. When permanent headgears and temporary hoists are in use, the company expects to sink about 200 ft. a month. South shafts No. 1 and 2 were 161 and 49 ft. down, respectively, at the end of May. Permanent headgear is being erected over the No. 2. Approximate ultimate depth of these shafts will be 5,600 and 5,700 ft., intersecting the Basal Reef at estimated depths of 5,400 and 5,500 ft. in about 3 years.

★Transport of materials and staff to the new gold mines near Odendaalsrust will be expedited as a result of the official opening of the railway line between Whites, on the main Johannesburg-Bloemfontein line, and Odendaalsrust, and a new air service between Johannesburg and Odendaalsrust.

★Tonnage of the 7 mining companies on the Witwatersrand totaled 4,626,700 in May, producing £2,047,142 in working profits and 977,878 fine oz. valued at £8,434,198, an improvement over March and April. Welgedacht mine in the Central Mining-Rand mines group, which started making returns 4 months ago, reported its first profit, £391; in April its loss was £3,222.

Gold output in the Transvaal was 978,617 fine oz., valued at £8,440,572 for April, of which 955,894 oz. valued at £8,244,586 were produced on the Witwatersrand.

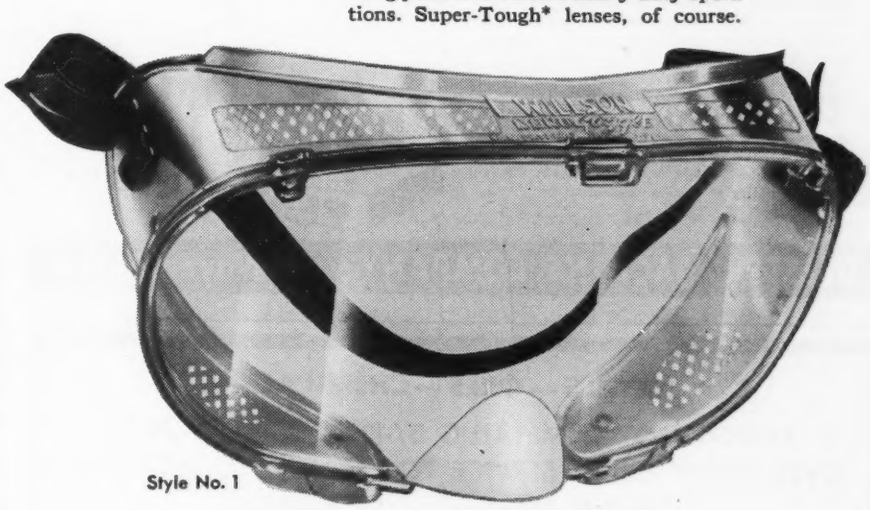
★Middle Witwatersrand (Western Areas), Ltd., which has options over extensive potential gold-bearing areas in the Orange Free State and the Transvaal, has agreed to cede to the newly-formed Kennecott-Anglovaal Exploration Co. certain unproved areas held under option. These do not include, nor are they in the vicinity of, the existing proved or semi-proved areas held by the company in the Virginia, Odeldaalsrust and Klerksdorp areas. The exploration company will refund to Middle Wits its total expenditure to date in most of the areas ceded and will carry out its own drilling program to test these areas. The two companies have made other mutually beneficial agreements for obtaining ground in the future.

★According to the monthly report of the Mines Department the value of the Transvaal production of alluvial

Add Comfort to Your Safety Program ...get WILLSON

Style F350

COMFORT IS IN THE SADDLE . . . With this broad saddle nose bridge, there's less fatigue in wearing these goggles over long periods of time in heavy duty operations. Super-Tough* lenses, of course.



Style No. 1

AN OUNCE AND A QUARTER OF PREVENTION . . . Lightweight, form fitting MONOGoggle can be worn all day with comfort. Tru-Hue green or clear plastic full vision interchangeable lens has high impact strength.

Style No. 45D

THIS LIGHTWEIGHT TAKES ON ALL DUSTS . . . Large throw-away filter and flexible molded face piece assure easy breathing and comfortable, snug, face fit. U. S. Bureau of Mines Approved.

*Reg. U. S. Pat. Off.

For complete information on these products and their application, as well as many more eye and respiratory protective devices, get in touch with your nearest Willson distributor or write us direct.

GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

DOUBLE WILLSON PRODUCTS INCORPORATED
READING, PA., U. S. A. Established 1870

255 Washington St., Reading, Pa., U. S. A.

The plateau feature of Deister PLAT-O Ore Concentrating Tables . . . a sloping resistance plane built into the table deck on a diagonal line . . . maintains a fixed line of demarcation between mineral and gangue. It results in more *complete stratification* and *higher recovery* of mineral content . . . fewer middlings . . . cleaner tailings.

In addition, PLAT-O provides a head-motion combination particularly adapted to the ore you are treating. This selected head-motion, combined with longer strokes and higher speeds, gives PLAT-O Ore Concentrating Tables *higher capacity* without affecting the quality of the concentrate.

For complete information on application of Deister PLAT-O Ore Concentrating Tables to your mill, write the Deister Machine Company, Fort Wayne 4, Indiana.

DEISTER
PLAT-O TABLES

DEISTER MACHINE COMPANY • Ft. Wayne 4, Ind.

METALS — ORES — CHEMICALS

FERRO-ALLOYS • METALLIC BY-PRODUCTS • SCRAP
OVER THIRTY YEARS SERVICE TO THE MINING INDUSTRY
IN THE MARKETING OF ORES.

Phibro

PHILIPP BROTHERS, Inc.
70 PINE STREET, NEW YORK 5, N. Y.
Cables: Phibro New York

Africa (*Continued*)

diamonds in April totaled £46,762 and of the Cape Province 1,268 carats valued at £15,247.

★The first gold mining lease in the Free State, St. Helena Gold Mines, has been signed, one of 8 leases for which applications have been made. It can be assumed that the other leases will not be delayed for long. Preliminary work by St. Helena began 2 years ago; this company, together with the other 7 companies, has made great development strides.

★Steps are being taken to reduce the amount of work done at the Alpine (Barberton) Gold Mine, and bring its activities to an end. Development work will cease and the assets of the company will be realized in due course. With this object in view, a program of operations on a reduced scale, designed to extract from the mine and to treat about 40,000 tons, at 2,000 per month, of developed and selected ore of a payable grade will be carried out.

★Stoltzberg Asbestos Co. in the Eastern Transvaal is opening up satisfactorily. The estimated ore reserve is 5,356,607 tons, the bulk of which, 4,893,750 tons, is in the eastern section of the mine with an estimated fibre content (chrysotile) of 3%. The Western section is estimated to contain 462,857 tons of 5% mineral, giving a total estimated fibre content of 169,955 tons.

In the central section of the property the outcrop of the lode has been prospected by opencast, trenches and quarrying over a distance of 3,350 ft., and adits will shortly be driven to test the continuity of the lode into the hillside.

★At the annual meeting of the Crown Mines it was stated that the available ore reserve had decreased by 11,194,000 tons since the end of 1939, and the number of stope faces available for production continued to be inadequate for the most economical working of the mine. The continued decrease in the ore reserve may be attributed to several causes, the chief being shortage of labor, lack of sufficient development ends and a decrease in the payable development footage.

★Although the tonnage milled and the profits of the 7 main gold-mining groups showed a net increase in May compared with April, actual gold output of the Union of S. A. was slightly lower. A reduction of 8,553 oz. in the output of the miscellaneous mines left Witwatersrand production 2,249 oz. lower for the month. Outside districts showed an improvement of 1,510 oz. The value of Witwatersrand production was £8,225,188, a decrease of £19,398; but, after allowing for a rise of £13,024 to £209,010 in the outside districts, the total value of output was £8,434,198, a reduction of £6,374.

★A new company, Chrome Mines of South Africa, Ltd., Union Corporation Bldg., 74 Marshall St., Johannesburg, with an authorized capital of £1 million (about $4 million) has been formed to amalgamate all the chrome interests of the Union Corporation Limited and the African Mining and Trust Co., (Pty.) Ltd. Of 4,000,000 shares, 3,200,000 have been issued, fully paid, to Union Corporation, Anglo-Transvaal Cons. Investment Co., Ltd., and African Mining and Trust Co. Existing producing mines are the Zwartkop and Tweelaagte mines in the Rustenburg district and the Groothoek mine in the Lydenburg district.

RUSSIA

Stalin awards for ore discovery, new methods of prospecting and processing

★Three Soviet geologists headed by D. F. Murashov were awarded a Stalin second prize for the discovery of large iron ore deposits on the Kola peninsula, providing for the creation of a raw material base for the northwestern metallurgical plant. Other prizes for successful exploration went

for prospecting the polymetallic deposits at Nikolayev; discovery of new sections of coking coals in the Karaganda coal basin; discovery, survey and industrial exploitation of large manganese deposits in the northern Urals; discovery, survey and industrial exploitation of large deposits of high-grade graphite in the Urals; for the geological prospecting and survey of the Volchansk coal deposits providing for creation of a new base of power coal in the central Urals.

Various new methods for processing minerals won awards. Among them were: working out and applying a process for converting shale into gas of high-calory content in chamber furnaces; working out and applying new methods to refine waste products of nickel production at the Norilsk works; working out and applying new methods of purifying nickel at the South Ural works; working out and applying methods of automatic control of mechanisms and processes in coal mines.

Another award went to a group of engineers of the Azerbaidjan section of the State Geophysical Trust for developing and applying the method of sea seismic prospecting in the Caspian area. The new method developed is described as making possible exploration by seismic instruments of geological structure to depths of several miles, and at sea as well as on land.

PHILIPPINES

Concentrating mill of Lepanto Consolidated is operating—Good tonnage of manganese ore reported

★May production of Mindanao Mother Lode amounted to $111,000 from 6,340 tons milled, averaging $17.50 per ton. While tonnage increased nearly 1,100 tons over April, ore grade was slightly less, reflecting the milling of considerable material from development work. Crosscuts are being driven from the bottom of the shaft at 850 ft. to reach the Tabon Tabon vein at this level on the south end, where the high-grade ore shoot on the 700 was approximately 400 ft. long. Because of the rake of the ore on the 700 level and the dip of the contact to the south, the length is expected to be longer on the 850 level. The crosscut to the vein will be 1,200 ft. in length, and at present rate of progress will require about 6 months to drive. A second crosscut is being driven on the 540 level to intersect the strike of the new Jesus vein at depth. Until these two important development projects are completed, the mine management believes that monthly output will not exceed $125,000, with mill tonnage around 6,500 per month.

★Surigao Consolidated production is reported to be increasing. Stoping

Save 50%
on Repair-Part Costs

Hard-surface with P&H Hartop electrodes—make your equipment last longer, produce more

Take a good look at this sprocket. Though badly worn, it is being built up with P&H Hartop. When the hard-surfacing is finished, this sprocket will cost ½ as much as a new one and will last 2 to 3 times longer. For Hartop's hard, protective coating gives you that much extra service. That's why using Hartop is a quick, low-cost way for you to keep your equipment at work longer, make it more productive. Hartop comes to you in handy weather-proof containers. You owe it to yourself to have a supply of these easy-to-use electrodes on hand. Four different types are available to give you the hardness you need:

Hartop Brown gives you a Rockwell C hardness of 35-40.

Hartop Green has a Rockwell C hardness of 45-50.

Hartop Red is still harder, giving you a Rockwell C hardness of 50-55.

And Hartop Yellow is the hardest electrode in the group — its Rockwell C reading is 58-63.

Use Hartop to keep your maintenance costs down and your production up. Ask your P&H distributor for our trial package containing all 4 types of these money-saving electrodes. It costs only $4.25. If he can't supply you, write us.

P&H WELDING ELECTRODES
4454 West National Avenue
Milwaukee 14, Wisconsin
HARNISCHFEGER CORPORATION

Ledeen CYLINDERS ARE GOOD CYLINDERS

Actuating gate valves is easy with Ledeen Heavy Duty Cylinders. Remote control operated they save many man hours.

• Push or pull, tilt or turn, lift or lower, open or close, press or squeeze.

Available from stock

Send for Bulletin 453

ENGINEERING PRODUCTS CO.
LEDEEN MANUFACTURING DIVISION
1604 SO. SAN PEDRO • LOS ANGELES 15, CAL.

Male or Female Thread

Recognized Universally as the ULTIMATE in Valves and Couplings

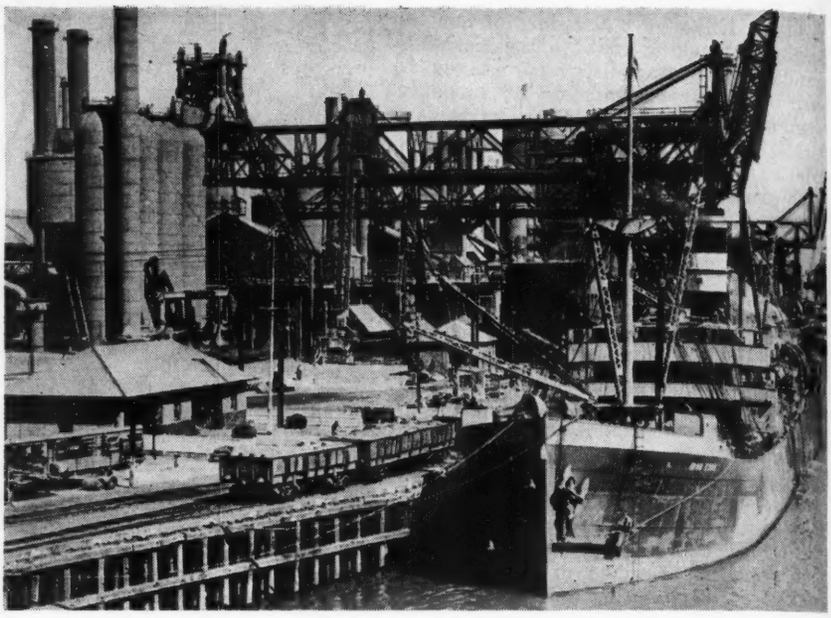
KNOX MANUFACTURING CO.

812 CHERRY ST., PHILA. 7, PA.

Since 1911 Producers of

KNOX

Valves - Couplings - Nipples - Clamps - Menders



IRON ORE SHIPS at Broken Hill Proprietary steel-works jetty, Newcastle, N.S.W.

Philippines *(Continued)*

operations have begun on the 300 level, with rehabilitation of the 400 level underway, as well as the reopening of a second shaft. When this is completed, mill output is expected to increase from 225 to 400 tons daily.

★May production from Benguet-Balatoc operations was reported at $263,270 from 36,959 tons milled, averaging $7.10 per ton. More new milling equipment is being installed, which will increase mill capacity to 1800 tons per day. About 60% of the April mill run came from Balatoc and 40% from Benguet.

★The new concentrating mill of Lepanto Consolidated was scheduled to start June 26. In designing the new plant the main adit to the mine was dropped 100 ft. below the prewar main adit. The tramming track and the coarse crushing plant were placed on the opposite side of the valley. Mine-run ore will be reduced to ¾ in. and then transferred by conveyor across the creek to the fine ore bin, reduced to 20-mesh by rod mill, and to minus 250-mesh by 2 ball mills, for flotation. It is planned to maintain an average mill head of around 4.5% copper and 0.115 oz. gold. Filipino labor and technical help will be used wherever possible. C. B. Foster is general superintendent of the mine.

★Chrome ore shipments in May from the Masinloc property totaled 18,500 tons, a decline of 3,500 tons from the April figure, caused by bad weather interfering with hauling and loading. Construction on the new washing plant is well under way.

★Luzon Stevedoring Co. loaded 1,550 tons of manganese ore from Gundulman, Bohol, in May, which averaged 50.4% Mn, and 1,800 tons from Busuanga Island averaging 51.5% Mn. Good showings of manganese are reported at Guindulman where the Japanese, during the occupation, had excavated a large open pit and extracted a considerable tonnage. Only high grade ore is now being mined, but large tonnages of wash ore are present. Costs are estimated at $3.50 per ton for mining and loading and $3.50 for trucking 18 kilometers to the tidewater.

AUSTRALIA

Wyalong Tin Mines, Ltd., to employ dry method of separation—New Coolgardie outlines program

NEW SOUTH WALES

★Ore production by North Broken Hill, Ltd., increased from 19,499 tons in the 4 weeks ended January 31, to 26,587 tons in the 4 weeks ended March 27. Lead concentrate amounted to 4,532 tons assaying 70.0% lead, 32.1 oz. silver, 4.9% zinc; zinc concentrate totaled 4,549 tons, with an assay value of 50.4% zinc, 1.2 oz. silver and 0.3% zinc. Because the pitch of the ore bodies to the north is making the distance of the workings from the main shaft excessive, a new main shaft will be sunk at a point 2,000 ft. north of the present main, or No. 2 shaft. This shaft will be of a type quite new to Australian mining practice—elliptical in section, the major axis 30 ft. and the minor axis 15 ft., concrete lined throughout; and will give a large area with smooth lining to the downcast air current. The area inside the lining will be 364 sq. ft., and the excavation area will be about 450 sq. ft. The shaft will accommodate 2 large double-decked cages, 10 ft. 9 in. x 5 ft. 3 in., internal dimen-

NEOPRENE SUCTION HOSE

Normally $5.50 Ft.

NOW

IN QUANTITIES OF 5,000 FT. OR MORE

ONLY 85 c FT.

IMMEDIATE SHIPMENT:

35,000 feet of 4" Navy Suction and Discharge Hose in 10 ft. and 30 ft. lengths, complete with 4" standard pipe nipples in each end, and Male and Female Couplings, attached.

FEATURES AND SPECIFICATIONS:

- 150 LBS. OPERATING PRESSURE.
- BURSTING PRESSURE, 600 lbs. IN LABORATORY TESTS.
- 4-ply NEOPRENE, stiffened with flat steel wire.
- 4" I.D., with round wire reinforcement in 1/16th" jacket.
- Mfr'd to Navy specs. 33-A-4P.
- Now being used by some of our customers in lieu of air lines and water pipe.

ALL ORDERS F.O.B. CARS, OGDEN, UTAH

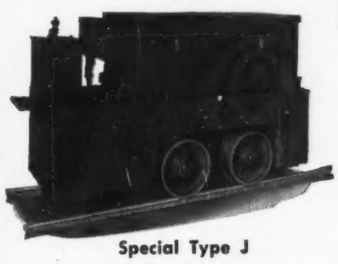
WRITE FOR QUOTATIONS IN SMALLER LOTS.

All orders subject to prior sale. Terms: 10 days net to rated accounts, otherwise send check or money order.

ASSOCIATED TRADERS, INC.

255 Kalamath Street, Denver, Colorado

ATLAS



Special Type J
1½ Ton Trammer

LOCOMOTIVES

HAVE THAT EXTRA

QUALITY

FOR DAY AFTER DAY

OPERATION

Battery operated. "Dead Man" control applies brakes when power is cut off. All electrical equipment is inclosed in gasketed compartments. Standard Safety Equipment.

ATLAS ENGINEERING SERVICE IS ALWAYS AT YOUR SERVICE

Canadian Representatives
Mine Equipment Co., Kirkland Lake, Ont.
International Agents & Machinery Co., Ltd., Vancouver, B. C.

South Africa
BMS Limited Industrial Stand
P. O. Box 50, Cleveland
Transvaal, South Africa

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

sions, running in balance; 2 7-ton skips in balance, and a small cage with counterweight; there will also be a ladderway compartment and a compartment for pipes and cables. The shaft will be sunk initially to a depth of 4,200 ft. but the winding equipment will be designed to operate to a depth of 5,200 ft. The new shaft will serve all levels to be opened out below the 3,070 ft. level which is now being developed from No. 2 shaft. Steel sets spaced at 12 ft. centers will be set in the concrete lining. Winding speeds will be 3,000 ft. per min. for skips, 2,500 ft. for large cages, and 1,200 ft. for the small cage.

★Zinc Corporation, Ltd., Broken Hill, plans to double mine output, now nearly 40,000 tons of ore per 4 weeks, at an estimated cost of £A10 million. There is to be a merger between Zinc Corporation, Ltd. and Imperial Smelting Corp., England, facilitating Zinc Corporation's policy of extending similar industries in Australia.

★New Broken Hill Consolidated, Ltd., won 62,367 tons of ore in 1947, a 50% increase over the preceding year. Of the total output, 38,243 tons came from development work and 24,124 tons from stoping. In addition, 45,405 tons were purchased from Zinc Corporation, Ltd. Net revenue from mine trading was (all figures in sterling) £289,366; increase over 1946, £169,960.

★Wyalong Tin Mines, Ltd., has been incorporated in Victoria with an authorized capital of £50,000 to operate a new developed method of dry separation of tin concentrates on the Gibsonvale tin field near Kikoira. Development of the Gibsonville placers has been hampered by lack of water, although the field has been "picked over" by prospectors relying on occasional rain falls. The ore is contained in small reefs enclosed in highly weathered granite, but it was not until 1938 that alluvial tin was found in payable quantities. Since then, 3,467 tons of tin concentrate have been won by prospectors.

The company has acquired from Air Separation Metals, Ltd., Melbourne, the rights to employ the patented dry separation process. From its affiliate, Air Separation Leases, Ltd., it has acquired a number of mining leases at Kikoira. A report by G. W. Osborne, a consulting engineer, prepared for incorporation in the prospectus, states that a demonstration of the dry treatment of cemented wash, pug and clay from Gibsonvale resulted in a very complete extraction, particularly of fine tin, and furthermore, substantially no loss was incurred in the clean-up, as in the case with sluice boxes.

NORTHERN TERRITORY

★The Tennant Creek goldfield is slowly attracting the attention it deserves from mining investors. The latest rich find is in the Skipper Extended lease, which has been opened

Backed by 25 Years Experience with Storage Battery Locomotives

2-motor drive; total 24 h.p.

Series parallel controller.

Extra long journal springs for better trackability.

Oil-tight, leakproof transmission. Use auto oil, renew every 6 months.

Adjustable Timken Roller Bearings throughout.

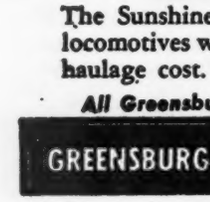
Strong, simple construction. Low maintenance.

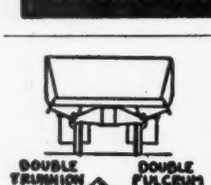
GREENSBURG "RANGER"

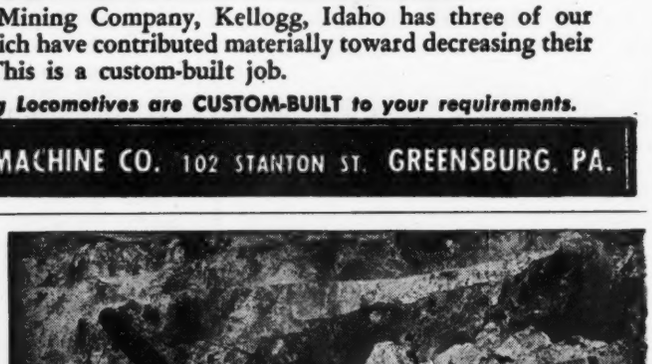
The Sunshine Mining Company, Kellogg, Idaho has three of our locomotives which have contributed materially toward decreasing their haulage cost. This is a custom-built job.

All Greensburg Locomotives are **CUSTOM-BUILT** *to your requirements.*

GREENSBURG MACHINE CO. 102 STANTON ST. GREENSBURG, PA.





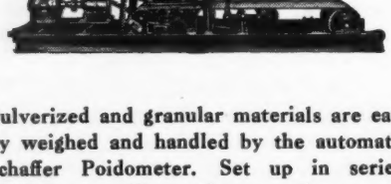


DIFFERENTIAL AIR DUMP CARS ● MINE CARS ● LOCOMOTIVES ● ROCK LORRIES ● HAULAGE SYSTEMS

DIFFERENTIAL STEEL CAR. CO. FINDLAY, OHIO

FEED–WEIGH–CONVEY

In *One Automatic* Operation



Pulverized and granular materials are easily weighed and handled by the automatic Schaffer Poidometer. Set up in series, Poidometers will exactly proportion a number of materials for one product. Recording devices accurately register the amount.

Self-contained and durable, the Schaffer Poidometer is used for bulk materials as large as 4" cubes. Varying capacities and speeds, different belt lengths, and special attachments make it highly adaptable.

for more information on Schaffer Poidometer features

Write for Catalog 7

SCHAFFER POIDOMETER CO.

2828 Smallman St. PITTSBURGH 22, PA.

Australia (*Continued*)

up to a depth of less than 100 ft. from surface; the tonnage milled was approximately 500 tons, and the recovery of gold is reported to be worth £A20,000, or about 4 oz. gold per ton. The find is said to be the largest in the postwar history of the field. Sands from milling operations, in which recovery is by amalgamation only, may be expected to be worth about 20 dwt. gold per ton, from ore of the grade reported.

Companies are slowly becoming interested, the main obstacle being the high purchase prices hitherto demanded by the owners of leases of promise. Possibilities of the field may be measured by the facts that the auriferous country is 40 miles by 35 miles in area, that orebodies have been opened up at more than 100 localities, and that the field to date has raised 250,000 tons of ore of an average recovered grade of 19 dwt. gold per ton, no more than 10 mines having reached a depth of 200 ft. and only one 300 ft.

★A newly designed plant for treatment of accumulated tailings and run-of-mine ore at the Eldorado Mine, Tennant Creek, was expected to be in operation within a few months.

★The Territory has attracted new mining capital recently, partly in response to liberal tax concessions. Practical tax immunity has been in effect for several years, but was due to expire recently. However, the mining industry has been assured of its continuance for at least another 3 years.

★To develop the Home of Bullion copper leases 200 miles north of Alice Springs, Home of Bullion Co., Ltd., has been registered in the Territory with a nominal capital of £775,000. Treasury approval is being sought for an issue of £350,000 to finance erection of a copper smelter. Official consent will depend on the sponsors' ability to submit evidence that sufficient ore can be worked to justify the expenditure. Associated with this project is Lindley Duffield (Metallurgical & Finance) Co., Ltd., an English concern.

★A man who borrowed £100 in a Tennant Creek hotel bar in 1942 to buy a half share in a little known gold mine recently sold this share for £200,000 ($650.000), according to Australian newspaper reports. The mine, known as The Whippet and located at Tennant Creek, was purchased by Gold Coring & Prospecting, N. L. for cash.

According to the latest available reports on The Whippet, the shaft has been sunk to a depth of 85 ft., and a drive put in for 30 ft. from this level. This showed good values throughout, over a possible width of 30 ft. It is proposed to sink a main shaft through virgin ground about 100 ft. east of the present exploratory shaft.

★Weaber's Rising Sun, N. L., is to float £20,000 to acquire options over the Rising Sun and Weaber's Find mines, both at Tennant Creek. The issue will be taken up by Shareholders of Australian Development, N. L., Adelaide. Development of the Rising Sun property will involve an initial expenditure of £5,000 to £6,000. The large orebody mined by open-cut methods, and the past production of Rising Sun (about 9,000 oz.) suggest that the shoots continue at depth, according to company officials.

WESTERN AUSTRALIA

★A revised Companies Act has come into force in this state. The act compels many No Liability mining concerns to amend their articles of incorporation. It also contains strict provisions against doctored or muddled prospectuses. Applicants for stock certificates must sign a statement that they have perused the prospectus. The new act is expected to do much to safeguard the investing public against questionable mining flotation. The Companies Act which it supersedes dated from 1893, the heyday of the Coolgardie gold rush.

★New Coolgardie Gold Mines has outlined the following program in the "Industrial Australian & Mining Standard":

In the Burbanks Group, preparations for unwatering the Birthday Gift shaft have been pushed ahead.

The plant comprises a 350-kw. Ruston generator and 1,000-cu. ft. compressor.

In the Hampton Group, prospecting of the Surprise leases has reached the limit of effective work, and sinking of a main shaft has begun. The headframe has already been completed.

The company has recently purchased 4 leases in the group. Of these, one covers the easterly extension of both north and south lodes of the Barbara leases. Development on the extension of the south lode has added 8,000 tons of approximately 14 dwt. to reserves.

★Hill 50 Gold, N. L. is planning to open up the continuation of the orebody which was disclosed between the 400 and 700 horizons by recent diamond drilling. A new plant is to be acquired to accelerate output. A new main shaft will be sunk to an immediate depth of 800 ft. Development work will be carried out at the 600 ft. level.

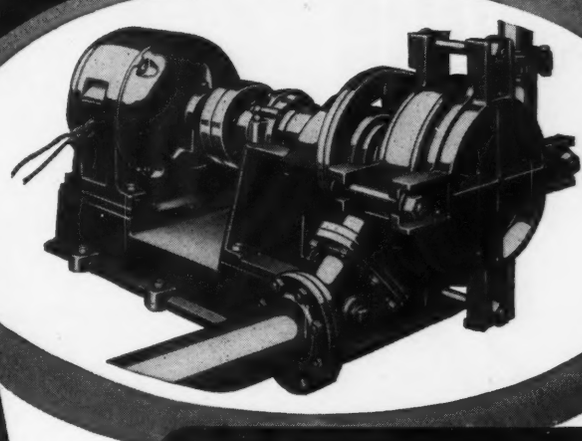
★Among papers read before the meeting of the Australasian Institute of Mining and Metallurgy, held in Kalgoorlie late in May, were: "Gold Room Procedure at Lake View and Star, Ltd.," R. C. Buckett, mill superintendent; "Application of Blasthole Diamond Drilling as a Stoping Method at Big Bell Mines, W. A.," P. C. Thomas; "Treatment Methods and Plant of Gold Mines of Kalgoorlie, Ltd.," E. K. Penrose, mill superintendent; "The Chemistry of Cyanidation, Protective Alkali," G. M. Willis, senior lecturer, University of Melbourne; "A Description of the Stripping and Re-timbering of the Ivanhoe South Extended Shaft, with Work Incidental Thereto," L. E. Elvey, assistant underground manager, Lake View and Star, Ltd.; "Stope Filling with Thickened Classified Flotation Tailings" (Great Boulder Mines), J. Holly.

TASMANIA

★The Australian Aluminum Production Commission has selected a site on the Tamar River, near Launceston, for the proposed plant to produce 10,000 tons of ingot aluminum per year. Plant design has been commenced and technical assistance has been engaged for co-ordination of design and construction, and for bringing the plant into operation. The Commission has within its control bauxite deposits in New South Wales containing 1,200,000 tons, in Tasmania 800,000 tons and in Victoria 100,000 tons. Field test work is being continued and is expected to result in additional tonnages being disclosed. The Bayer process is to be used for the production of pure alumina from crude bauxite, and the Hall-Herault process for the production of electrolytic aluminum from the alumina. At present rate of consumption, output of 10,000 tons per year of ingot aluminum will greatly exceed Australian requirements.

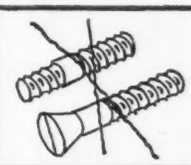
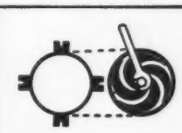
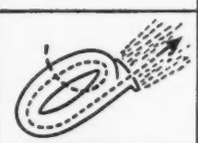
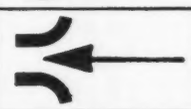
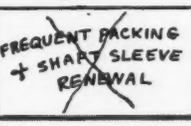
Helps avoid your biggest pump problems

Morris Type "R" Slurry Pump



Gives longer uninterrupted service

Ordinarily harsh abrasives wear out your pump. The corrosive action of acids eats away its utility. Time-consuming maintenance and repairs cut down your production. Now see why the Morris Type "R" helps avoid these problems.

1		**Simple design**—The Morris Type "R" has no internal studs and bolts. Nor does it have troublesome internal joints and fits. The Suction Disc Liner is merely *clamped* into position between disc and shell. *Fewer wearing parts means less maintenance and longer uninterrupted service.*
2		**Easily dismantled**—The impeller and shaft sleeve of the Morris Type "R" Slurry Pump can be renewed *without disturbing* the suction and discharge piping or the bearings. This means considerably less lay-up time.
3		**More abrasive resistant**—With the clamping effect of the bolts on the discs, the shell is not subject to high stress. Consequently, the shell can be made of a large variety of materials, including those of high abrasive resistance. Yet these materials need not necessarily be of high tensile strength.
4		**The hydraulic passages of the suction disc are extremely large and velocities are low. As a result, wear is minimized and renewal infrequent.**
5		**Stuffing box troubles are practically eliminated because the suction gland is under low suction pressure only.**

For Mining—Morris Type "R" Slurry Pump handles all types of mixtures containing abrasive solids and chemicals in suspension, including acid slurries and sludges . . . and also slurries containing soda ash, ore concentrates, tailings, slag, coal, etc.

MORRIS Type "R" SLURRY PUMP

More easily maintained . . . more easily dismantled . . . more hours of continuous service. Proved by 84 years' Morris experience in pump building.

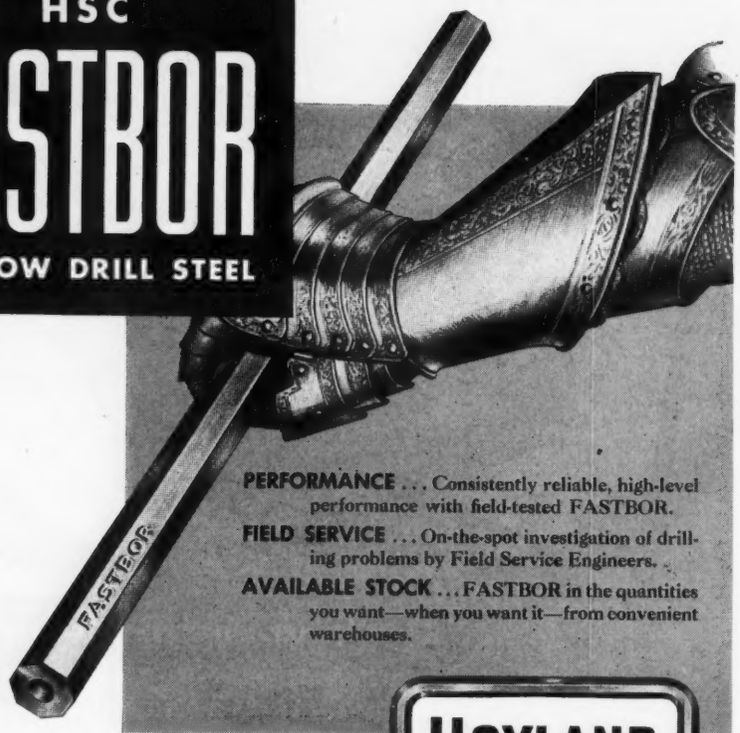
MORRIS CENTRIFUGAL PUMPS

MORRIS MACHINE WORKS

BALDWINSVILLE, N. Y.

Offices in Principal Cities

HSC
FASTBOR
HOLLOW DRILL STEEL



PERFORMANCE . . . Consistently reliable, high-level performance with field-tested FASTBOR.

FIELD SERVICE . . . On-the-spot investigation of drilling problems by Field Service Engineers.

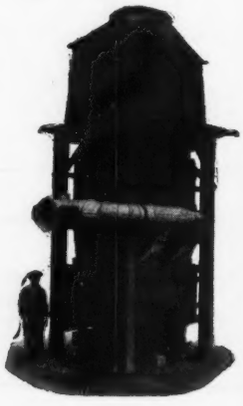
AVAILABLE STOCK . . . FASTBOR in the quantities you want—when you want it—from convenient warehouses.

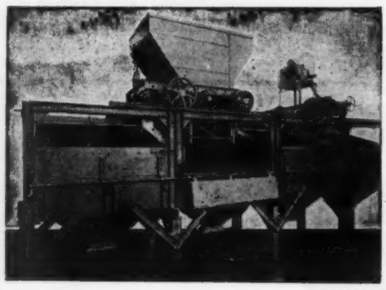
HOYLAND STEEL

DISTRIBUTORS: Hoyland Steel Company, Inc., 405 Lexington Avenue, New York 17, N. Y. • Great Western Steel Co., Inc., 1011 East 61 Street, Los Angeles 1, California • Asarco Mercantile Company, 1213 Mills Building, El Paso, Texas • Bitco, Inc., P. O. Box 929, Wallace, Idaho • Arizona Mining Supply Corporation, Prescott, Arizona • Empresas Unidas, S. A. Calle de Gante 7-106, Mexico, D. F.

Smelting on Site
with
MACE Furnaces
and
Sintering Hearths

Saves high transportation and treatment charges on your ores and concentrates.





Wire or write for new catalog.

Our Denver Smelter is equipped to make complete working scale tests on ton lots or larger. Send us an analysis for preliminary investigation.

The Mace Company
FINE CONCENTRATION METALLURGISTS
2763 BLAKE STREET, DENVER 5, COLO., U.S.A.

Climax Molybdenum Co. Votes to Extend Scope

At a special meeting of stockholders held late in June, an amendment to the certificate of incorporation of Climax Molybdenum Co. was approved, permitting the company to extend scope of activities to fields other than molybdenum. The company can now engage in mining of other metals and minerals, including petroleum and gas, although at the time of the meeting the president informed stockholders that there was no deal pending whereby Climax planned to enter the petroleum producing industry.

Nellie B Co. Purchases Okla. Mining Property

The Nellie B Mining Co. and Chicago interests have purchased the Oklahoma mining properties of the Rialto Mining Corp. from Dr. A. G. Hull, one of the largest independent operators in the Tri-State field. The sum involved was estimated at $500,000. The property has produced since 1915, output averaging around $1 million annually.

Trail Lifts Lead Payment After Cut in U.S. Tariff

Suspension of the import duty on lead by the United States for one year has resulted in an increase in the allowance to custom mines shipping ores and concentrates containing lead to the Consolidated Mining & Smelting Company of Canada, Trail, B. C., the company announced July 6. Shippers will receive 0.9c per lb. more for lead now paid for in either lead ores, lead concentrates, or zinc concentrates. Though the duty amounted to 1.0625c. per lb., it was only possible to pass on 85% of the increase to the shipper because of increases in freight rates on Canadian and U. S. railroads amounting to about 20% since the first of the year. The company incorporated this change and other minor ones in recent schedules for both lead and zinc, effective June 20.

Linde Air Will Supply Tonnage Oxygen

A plant to produce 360 tons, or approximately 9 million cu. ft. of 95% pure oxygen a day will be built and operated by the Linde Air Products Co., a unit of Union Carbide and Carbon Corp., to supply oxygen to the Bell, W. Va., plant of E. I. du Pont de Nemours and Co. Oxygen will be piped directly from Linde's plant to the du Pont plant under long-term contractual arrangement. Construction of the plant, to be located on du Pont property, is expected to be complete sometime in 1949.